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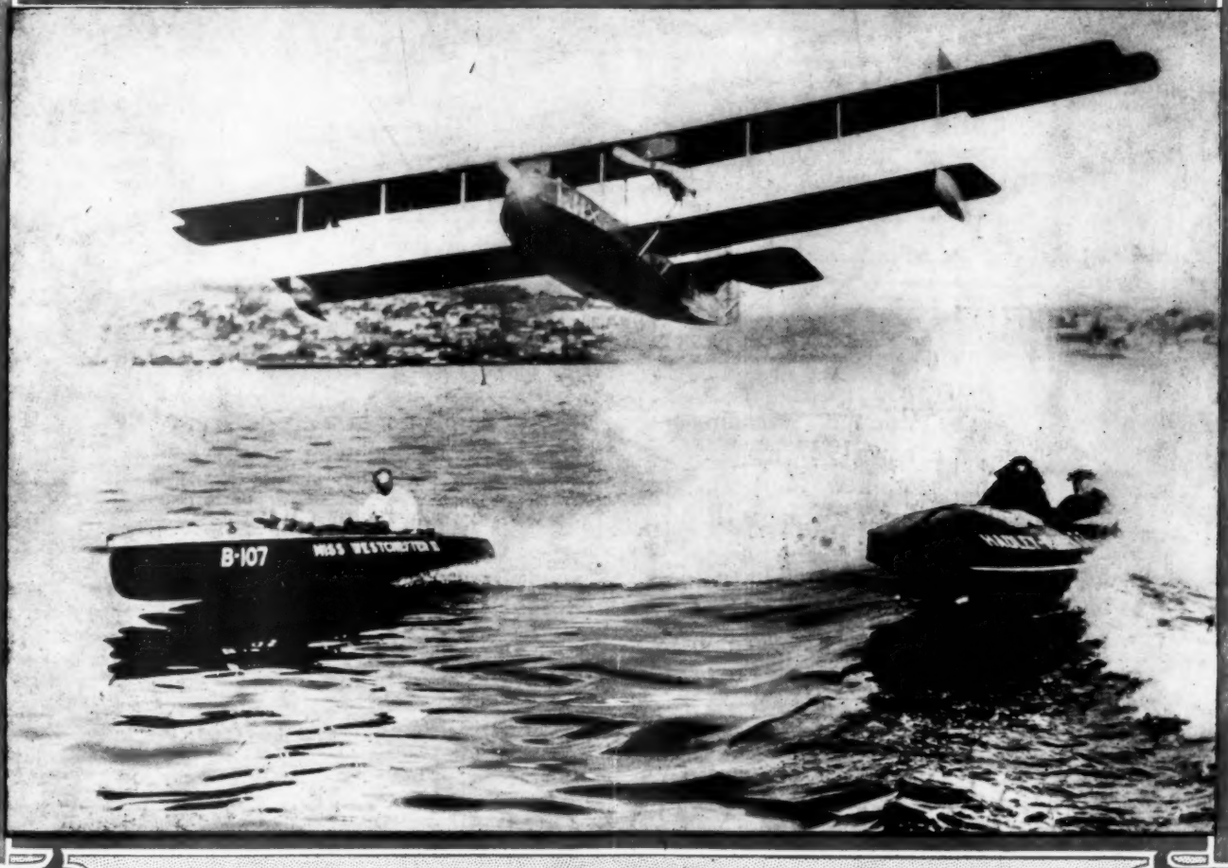
AVIATION

The Oldest American Aeronautical Magazine

DECEMBER 27, 1926 Issued Weekly PRICE 15 CENTS



Speed boats in the Elgin Trophy Race (San Diego) paced by an HS flying boat.

VOLUME XXI

NUMBER 26

SPECIAL FEATURES

AIR CORPS FLIERS LEAVE ON PAN-AMERICAN FLIGHT
THE SECRETARY OF THE NAVY REPORTS ON AVIATION
CONSTRUCTING AND MERCHANDIZING THE EAGLEROCK

GARDNER PUBLISHING CO., Inc.
HIGHLAND, N. Y.
225 FOURTH AVENUE, NEW YORK
Entered as Second-Class Matter, Nov. 22, 1920, at the Post Office, at Highland, N. Y. under Act of March 3, 1879.

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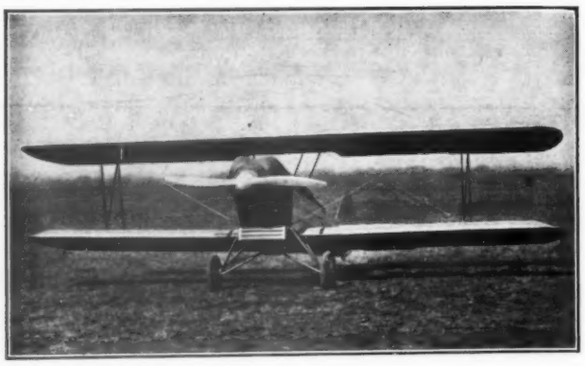

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More WACO'S are now in service for profit and pleasure than all other planes now in production in America.

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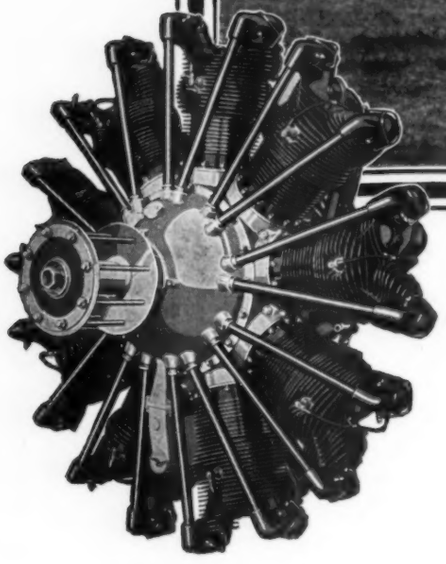

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425 HP at 1900 RPM
WEIGHT 650 lbs.

Another "WASP" Success

The "Wasp" has definitely proven its superiority to the water cooled powerplants in the Navy single-place fighters.

Flight tests of this new two-place observation type equipped with the "Wasp" indicate the same superiority. This new ship is indeed a worthy successor to the long line of successful Vought types.

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AVIATION

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With the Editor

The all-important question of merchandizing, while one of the paramount problems in all classes of business, is, perhaps, the one question which the Aircraft Industry, in tackling the growing commercial demand for airplanes, has most neglected. This has been due, no doubt, to the fact that the Industry, grown up, as it has, on Government orders, has not had to recourse to strict business methods in creating markets for its products. Yet, with the rapid growth of commercial aviation and the ever increasing civilian market for aircraft, there is no doubt that merchandizing methods which have been developed by sales departments in other industries will soon find a place in the business of the Aircraft Industry. The time purchase or part payment system, now almost universal in the automobile industry, is not only a basis upon which this industry is built up, but has been responsible for bringing the automobile within the financial reach of the "man-in-the-street". In the aviation field, this system would have equally favorable results all around. How the part payment plan has been adopted by the manufacturers of one of our best light commercial airplanes is told in this issue.

In 1926
WRIGHT WHIRLWIND ENGINES
Flew More Than
1,750,000 MILES
In Commercial and Private Airplanes

Whirlwinds Have In 1926;

In Competition

Made first North Pole flight by Commander Richard Byrd in Fokker 3-engined plane.

Won 1st place Annual Reliability Tour of 2,555 miles in TravelAir plane carrying 600 lbs. pay load, average speed 124½ m.p.h.

Won 2nd Place Annual Reliability Tour in Buhl Verville Airster carrying 800 lbs. pay load, average speed 113.5 m.p.h.

Won 3rd Place Annual Reliability Tour in Stinson "Detroiter" carrying 640 lbs. pay load, average speed 106.7 m.p.h.

Won Transport Race for Detroit News Air Transport Trophy at Philadelphia in Wright Bellanca carrying 1,607 lbs. ballast at 121.53 m.p.h.

Won Light Commercial Race at Philadelphia carrying 1,145 lbs. ballast at 121.36 m.p.h.

Won 12 out of 18 prizes they competed for at Philadelphia.

Won 3 First Prizes at Denver Mile High Air Meet in Ryan M-1.

Made Non-stop Portland, Oregon to Los Angeles flight 1,050 miles 9 hrs. 20 min. in Ryan M-1 Monoplane of Pacific Air Transport.

Carried 2,666 lbs. pay load at Philadelphia at 114.99 m.p.h. in the Stout 3-engined airliner built by the Ford Motor Company.

In Daily Service Flown for

Philadelphia Rapid Transit Company—339,950 engine miles with $75.55 cost of engine parts averaging 10½ gal. fuel per engine hour on their 255 mile route—Philadelphia, Washington, Norfolk, using 12 WHIRLWINDS exclusively in Fokker planes.

Varney Air Mail Service—172,080 miles with $78 cost of engine parts on their 520 mile route across the Rocky Mountains from Salt Lake to State of Washington using 7 WHIRLWINDS exclusively in Swallows.

Colonial Air Transport—89,000 miles with $225 cost of engine parts on their 192 mile route New York to Boston, using 4 WHIRLWINDS exclusively on this route in Fokker and Curtiss planes and 3 in their Fokker Airliner.

Pacific Air Transport—251,700 miles on their 1,121 mile route Los Angeles to Seattle using 8 WHIRLWINDS exclusively in Ryan and Travel Air planes.

Northwest Airways since October—39,600 miles on their route 377 miles Chicago to St. Paul using WHIRLWINDS exclusively in Stinson "Detroiters."

National Air Transport—30,980 engine miles as part equipment for their 987 mile route Chicago to Dallas in Travel Air, Ford—3-engine plane and Wright Bellanca.

Florida Airways—74,690 miles, as part equipment, on their 683 mile route Atlanta to Miami using 4 WHIRLWINDS in Stinson and Curtiss planes. Carried $2,000,000 currency into Miami from Atlanta the day after the hurricane, in Stinson "Detroiter".

Canadian Air Express 40,590 miles on their route at Red Lake, Canada, using 3 WHIRLWINDS exclusively in Stinson "Detroiters" and Curtiss Larks.

Huff-Daland Dusters, Detroit-Arctic Expedition, Charles Dickinson, Henry Dupont of Wilmington and Pontiac, Canadian and American Fairchild Company, Bennett & Rodebaugh of Alaska, Central Canada Airlines, Frederick Ames of Boston and many others.

These performances recommend to pilots the Wright Whirlwind, 200 H.P. Air-Cooled Engine for

SAFETY — ECONOMY — DURABILITY

That's why More Pilots fly them!

WRIGHT AERONAUTICAL CORPORATION, Paterson, New Jersey, U. S. A.

AVIATION

THE OLDEST AMERICAN AERONAUTICAL MAGAZINE

VOL. XXI DECEMBER 27, 1926 No. 26

A Logical Airship Decision

IT IS most satisfactory to learn that the proposal made in the President's Budget Message for indefinitely postponing the date of starting construction on the first of the two 6,000,000 cu. ft. rigid airships, is meeting with opposition from the House Naval Committee.

There is no doubt that the investigation and report of the Morrow Board stimulated in Congress a real understanding of and sympathy in the necessities of the national defense in the air and the development of aviation in general. In some respects, it is an entirely new sensation to the Aircraft Industry to find a congressional committee especially delegating its chairman to petition the President to reconsider the withholding of $4,000,000 for the construction of an airship. Yet, such is the concern with which aviation is now being viewed in Washington. Quite apart from the actual case in point and regardless of whether or not the expenditure of this large sum at this time on an airship is warranted, the incident is a highly significant one.

However, in requesting the President to reconsider his recommendations in regard to the airship program, there is no doubt that the House Naval Committee is following the only logical conclusion. After a long debate in committee during the last session, Congress was convinced that, in the light of recent developments, this country should satisfy itself, once and for all, as to the value of large lighter-than-air craft in the national defense. Accordingly, it authorized the lighter-than-air construction program for the Navy, setting a time limit on the date of starting the first of the two large airships. This decision was the result of most careful consideration. The fact that the Government decided at the same time to experiment in an entirely new and untried principle in lighter-than-air construction, namely, the metal-clad airship, is absolutely irrelevant and should in no way be permitted to influence a well considered decision.

As was pointed out in these columns last week, the metal-clad experiment sounds very promising but will take at least two years to prove or disprove, as the case may be. In the meantime, are we to hold up all further progress in lighter-than-air development, despite the fact that other nations are forging ahead? Not only is the development itself to be held up, if the recommendations in the Budget Message are adhered to, but, in two years time from now, we shall find ourselves actually behind the position in which we are today with regard to lighter-than-air, for that section of the Aircraft Industry which has devoted its attentions to this field cannot be expected to hold out indefinitely under the suspended delay.

Lighter-than-air development should progress to its logical conclusion in national defense or in commerce. Other nations are pushing ahead and we must do likewise.

Airway v. Railway Growth

THE RAILWAYS of the United States are almost ready to celebrate their one-hundredth birthday and today they are not only absolutely essential to our industry but represent one of the largest forms of capital investment. The growth of the railroads, however, was slow and difficult. In 1830 there were 23 miles of railway in the United States. During the next ten years, the mileage increased to 2,818 and, by 1850, it had reached the total of 9,021 miles. The greatest growth occurred between 1880 and 1890 when the length of permanent way increased from 93,267 miles to 163,605 miles. This proved to be too swift an expansion and the rate thereafter was slower. The present mileage is 250,000 miles and a saturation point appears to have been reached as the mileage has actually decreased during the last few years.

The study of railroad growth is of real interest to those engaged in aerial transportation. The God fearing people of 1830 were just as afraid of the railroads as the average citizen of today is afraid of aerial transportation. Rail transport of those days offered much greater speed than did water-borne traffic but failed in reliability and terminal facilities. The railroads of today would fail within a year if the business which they had built up should revert to the business and industrial conditions of 1830. In the same way, the aerial transportation system of 1950 would certainly die from lack of traffic if it existed today for it takes the public a long time to adjust itself to a new form of transportation.

That the public is taking advantage of air transportation is shown by the increase in revenue on the Government operated trans-continental air mail route. The total excess postage received for the year ending June 30, 1926 was $861,865.05, an increase of $259,237.51 over the previous year. With the proper functioning of the feeder air mail lines, the revenue has increased much more rapidly during the last few months. In July, there was an increase of $12,703 over the previous year; in August, an increase of $18,459; in September, a gain of $22,776, while in October, the gain over the previous year was $30,642, an increase of 50 per cent over the 1925 receipts.

In the matter of mileage of regular routes, the development of airlines in this country has been more rapid than that of the railroads. By 1830, the locomotive had been under development for a longer time than had the airplane when the first air mail lines in the United States were started in 1918. There are now in this country over 7,000 miles of regularly operated air mail lines while by 1840 there were only 2,818 miles of railroad. While it is true that all of this airway mileage is not as yet permanently equipped, the progress which has been made is highly significant.

Air Corps Planes to Start on Pan-American Flight

Five Loening Amphibian Planes Ready to Leave San Antonio on Flight Around S. America.

FIVE AIRPLANES, piloted by ten officers of the U. S. Army, Air Corps were scheduled to leave Kelly Field, San Antonio, Tex., on Dec. 20, on the first stage of the Pan-American flight which will cover 18,500 miles and include stops at every country in South and Central America and the principal islands of the West Indies, but were detained by fog.

From the Army base the planes will follow the East Coast of Mexico to Puerto, Mexico, and then cross the Isthmus of Salina Cruz to the Army air station in the Canal Zone. From Colon the route will follow the West coast of South America to Valdivi, in Chile, from which point the fliers will turn East and cross the continent to Bahai Blanca on the Atlantic Coast of Argentine. From there the fliers will go to Buenos Aires, a short hop, preliminary to a 700 mile trip up the Parana River into the interior, which will include a stop at Asuncion, the capital of Paraguay. Going back by the same route to Montevidio, the planes will again follow the coast line northward, visiting Brazil, the Guianas and Venezuela. At Trinidad, the route leaves the mainland of South America and a series of inter-island hops through the Lesser Antilles, Porto Rico, the Dominican Republic, Haiti and Cuba will bring the fliers to Miami, Florida. En route to Washington, the planes will make stops at Jacksonville, Savannah, Wilmington and Langley Field, Va.

Personnel of the Flight

Maj. Herbert A. Dargue has been appointed commanding officer of the Pan-American Flight. Capts. Arthur B. McDaniel, Ira C. Eaker and Clinton F. Woolsey, and Lieuts. Bernard S. Thompson, Leonard D. Weddington, Charles McK. Robinson, Muir S. Fairchild, Ennis C. Whitehead and John W. Benton compose the balance of the flight personnel.

The five Loening Amphibians with inverted Liberty engines which are being used in the flight have been equipped with an extra fuel tank, to allow a continuous flight range of nearly ten hours. At 100 m.p.h., this will give a cruising range of about 1,000 miles. The longest single hop, according to present arrangements, lies between Neugen and Bahia Blanca, in crossing South America from Chile to Argentine, a distance of 565 miles.

The object of the flight is not primarily to set speed records, but is for the purpose of securing extensive training in cross-country flying for the Air Corps personnel. Delays will be arranged to permit the most painstaking care of the planes and engines. The flight will demonstrate the practicability of linking the two American continents by air and will undoubtedly strengthen the amicable relations now existing between the Central, South and North Americas.

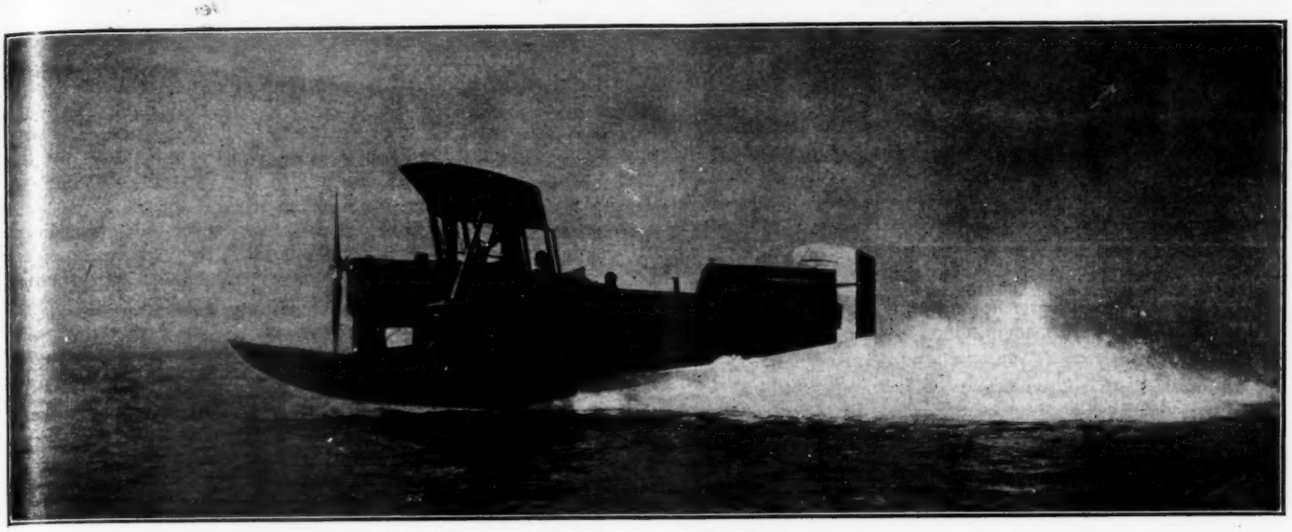
The Loening Amphibian planes are admirably suited to a flight of this nature since the route to be followed takes the machines over extensive stretches of both land and water. The Loening Amphibian, while maintaining the high performance necessary of a service observation machine, functions as a seaplane or as a landplane equally well. It is the only amphibian airplane constructed which combines these qualities to such a high degree. As previously stated, the machines are powered with Liberty engines. These drive three-bladed Standard Steel propellers, which have long demonstrated their ability to withstand hard service such as will be experienced on this 18,000 mile flight.

Each plane will carry two officers as pilots, and each pilot will alternate during the flights. To increase the possibility of the machine being located quickly in the event of a forced landing the fuselages of the planes have been painted black and the wings yellow.

The planes and personnel of the flight have been assigned as follows, the airplanes having been given the names of well-known American cities:

Flag Ship—*New York*—Maj. H. W. Dargue and Lieut. Ennis C. Whitehead; *San Antonio*—Capt. Arthur B. McDaniel and Lieut. Charles McK. Robinson; *San Francisco*—Capt. Ira C. Eaker and Lieut. Muir S. Fairchild; *Detroit*—Capt. Clinton F. Woolsey and Lieut. W. Benton; *St. Louis*—Lieut. Bernard S. Thompson and Lt. Leonard D. Weddington.

Personnel of the Pan-American Flight. 1, Lieut. John W. Benton 2, Capt. Ira C. Eaker 3, Major Herbert A. Dargue 4, Capt. Arthur B. McDaniel 5, Lieut. Muir S. Fairchild 6, Lieut. E. C. Whitehead 7, Lieut. L. D. Weddington 8, Capt. C. F. Woolsey 9, Lieut. Bernard S. Thompson 10, Lieut. Charles McK. Robinson.



One of the Loening Amphibian (Liberty) planes of the Pan-American flight.

As previously reported in AVIATION, the entire flight has been divided into six divisions, as follows:

	Mileage to Next Stop
FIRST DIVISION	
San Antonio, Tex., United States	250
Brownsville, Tex., United States	253
Tampico, Mexico	237
Vera Cruz, Mexico	136
Puerto Mexico, Mexico	150
Salina Cruz, Mexico	383
Guatemala City, Guatemala	55
San Jose, Guatemala	110
San Salvador, Salvador	110
Ampala, Honduras	350
San Jose, Costa Rica	210
David, Panama	250
France Field, Panama, Canal Zone	400
SECOND DIVISION	
Buenaventura, Colombia	185
Tumaco, Colombia	455
Tumbez, Peru	130
Paita, Peru	255
Trujillio, Peru	300
Lima, Peru	290
Lomas, Peru	200
Mollendo, Peru	415
Tocopilla, Chile	250
Taltal, Chile	330
Coquimbo, Chile	305
Santiago, Chile	350
Talcahuano, Chile	235
Valdivia, Chile	300
THIRD DIVISION	
Nouquon, Argentina	320
Bahia Blanca, Argentina	565
Buenos Aires, Argentina	240
Santa Fe, Argentina	315
Corrientes, Argentina	180
Asuncion, Paraguay	180
Corrientes, Argentina	315
Santa Fe, Argentina	360
Montevideo, Uruguay	340
Rio Grande do Sul, Brazil	375
Florianopolis, Brazil	300
Santos, Brazil	210
Rio de Janeiro, Brazil	270
FOURTH DIVISION	
Victoria, Brazil	280
Porto Sagura, Brazil	240
Bahia, Brazil	435
Pernambuco, Brazil	160
Natal, Brazil	455
Camocim, Brazil	240
Maranhao, Brazil	370
Para, Brazil	515
Cheyenne, French Guiana	210
Paramaribo, Dutch Guiana	220
Georgetown, British Guiana	360
Port of Spain, Trinidad, (Gr. Br.)	365
La Guayra (Garacas), Venezuela	365
Port of Spain, Trinidad (Gr. Br.)	100
FIFTH DIVISION	
St. George, Island of Grenada (Gr. Br.)	85
Kingstown, Island of St. Vincent (Gr. Br.)	100
Fort de France, Island of Martinique (Fr.)	125
Pointe a Pitro, Island of Guadeloupe, (Fr.)	265
St. Thomas, Virgin Islands (U. S.)	80
SIXTH DIVISION	
San Juan, Porto Rico (U. S.)	215
Santo Domingo (Dominican Republic)	210
Port-au-Prince, Haiti	270
Santiago de Cuba, Cuba	175
Manzanillo, Cuba	250
Cienfuegos, Cuba	145
Havana, Cuba	250
Miami, Florida (U. S.)	330
Jacksonville, Florida (U. S.)	130
Savannah, Georgia (U. S.)	255
Wilmington, North Carolina (U. S.)	200
Langley Field, Virginia (U. S.)	130
Washington, D. C.	END
	18,524

Map of the entire route of the Air Corps Pan-American flight

The Secretary of the Navy Reports on Aviation

Secretary Wilbur Outlines Progress in Naval Aviation, Drawing Attention to Design and Power Plant Progress.

THE ANNUAL Report of the Secretary of the Navy for the fiscal year 1926 has recently been made and the subject of aviation naturally fills an important part of this report. Secretary Wilbur emphasizes the close cooperation which has been obtained with aircraft working with the fleet and outlines in brief the development activities during the past year. Without doubt the most prominent and important development work which has been carried out by the Navy has been in the pefection of power plants for aircraft in cooperation with the Aircraft Industry, and it is satisfactory to note that considerable mention is made of this important aspect. Powder driven catapults and the design of large patrol seaplanes also receive due mention in the report.

Extracts of that section of Secretary Wilbur's report dealing with aviation are printed below:

Since the end of the World War the principal effort of the Navy Department has been directed toward the application of aircraft to fleet operation and development of suitable aircraft for that use. It was largely pioneering work, as the experience with aviation during the war, concentrated on antisubmarine activities, had not indicated clearly the role which aircraft might fill in fleet operation, nor was there any material experience in foreign countries which could serve as a guide. Progress in the art of aviation continues, and the importance of the work of aviation with the fleet increases correspondingly, but sufficient experience has now been had so that the present scope of aviation with the fleet is growing to be well understood, and the Navy now has reached the position of being able to lay down definite requirements for the small number of classes of aircraft to carry out the several strategical and tactical functions of naval aviation. Steady progress has been made in developing designs of aircraft to meet the special demands of each class, and research and development are being carried on with the prospect of definitely continuing this progress. Service types have been developed in each of the classes of aircraft decided upon as necessary, and while efforts to improve those designs have been going on and will continue an urgent requirement now is the procurement of a sufficient number of airplanes of each of the classes, with adequate replacements, to permit the filling out of the tactical organization of naval aeronautics and of its efficient operation as a part of the fleet.

Aircraft in Fleet Maneuvers

The operation of aircraft for the units of the fleet reached a still higher state of efficiency during the last year. Observation planes for spotting and other service are now carried on practically all of the battleships and light cruisers, and in the course of maneuvers are catapulted into the air simultaneously on signal from the flagship.

During the past year both the fighting and observation squadrons of the Battle Fleet have been qualified to operate from the decks of the aircraft carrier *Langley*. The time necessary to get planes into the air from the decks of the *Langley* and to land them on board ship again has been greatly reduced.

Marked advances have been made in the efficiency of radio communication from ships to planes and from planes to ships, and a decided improvement has been made in the procedure used by aircraft in the spotting of shots for the fleet.

Instruction

Courses of instruction in aviation for Navy personnel have been actively maintained. These have been described at length in the personnel section of this report.

Aircraft Carriers

The U.S.S. *Langley*, basing at San Diego, Calif., has been engaged in active operations with the Battle Fleet. Considering the limitations of this vessel, especially in regard to speed and the number of aircraft it can accommodate, the results have been highly gratifying and served to demonstrate the value and possibilities of its type. In conjunction with its activities with the fleet, the *Langley* has also made considerable progress in the development of airplane-arresting gear, flying-deck equipment, and the general technique of flying-deck operations, attaining a high degree of speed and reliability under all sorts of weather conditions.

Full advantage is being taken of the experience gained on the *Langley* in the design and development of the aviation facilities on the *Lexington* and *Saratoga*.

The airplane-arresting gear and catapults for these vessels have been manufactured and tested in preparation for their installation aboard, and an arresting gear of the type to be used has been installed on a carrier "deck" laid out on the field of the Hampton Roads Naval Air Station to permit of trial of the arresting of actual airplanes and also to provide added experience for pilots. The equipment, which had to be of special design to meet the unique requirements of the service, is considered to be the most advanced that modern engineering has produced to date.

The use of aircraft carriers, of course, involves in turn new problems in airplane design which have been receiving attention during the year. In addition to being strengthened for the special stresses of launching and arresting, the structure must be reduced to an extreme of compactness to provide for storage of the greatest possible number of machines in those decks. Folding or readily demountable wings are desirable, and increased progress is being made in this direction.

Catapults

Powder-propelled catapults have been perfected and are being installed on the battleships for launching observation and scouting planes. Also an amphibian type of airplane has been successfully launched from the catapults. These powder-propelled catapults operate successfully in the fleet and constitute a great improvement over the old type.

Lighter-than-air Activities

Following the *Shenandoah* disaster the situation as regards development of the lighter-than-air side of naval aviation was canvassed. The Navy Department is continuing the development of this branch of aeronautics with particular emphasis on large airships capable of use with the fleet.

Authority was granted at the last session of Congress for two large airships of about 6,000,000 cubic feet volume, but funds to start construction have not been appropriated. Contract for an experimental "metal-clad" airship of 200,000 cubic feet volume has been placed, as authorized by Congress.

The naval air station, Lakehurst, N. J., is being kept in operation, but it has been necessary to curtail the activities at this station.

The dwindling supply of helium obtainable from the Fort Worth plant is a source of concern. Some arrangement for tapping one of the near-by fields containing larger quantities of helium is a necessity. With increased production it is probable the unit cost of helium can be still further reduced. The efficiency of use of helium in lighter-than-air craft is much increased by the possibility of repurification and restoration of the original value after contamination by other gases has lowered the purity, and so the lifting power, excessively. Such work is done in the repurification plant at Lakehurst, the only one of its kind operating until the summer of 1926, when the Army secured equipment of its own.

Aircraft Power Plants

Steady and rapid progress has been made in the development of power plants for naval aircraft. Through the development of air-cooled engines the weight per horsepower of the power plant has been reduced by about one-third. Through improvements and refinements in cylinder design, the fuel economy of air-cooled engines has been improved by 10 per cent over that of water-cooled engines. Also through improvement in design, and through more careful maintenance, the dependability of aircraft engines has been very greatly increased. Forced landings have been materially reduced in number. The durability of aircraft engines has been improved by about 400 per cent over that of the war-time engines. With the development of the new air-cooled engines the cost of maintenance is being greatly reduced, and time required to overhaul the air-cooled radial engines is materially less than that of the water-cooled engines. The reduction in cost of maintenance will more than pay for the cost of the development of the new engine types.

Development work has been concentrated on the production of three air-cooled engines, one of 200, one of 400, and one of 500 horsepower, with a view to making these three engines meet all of the needs of naval aviation. The 200-horsepower engine is used in training. For this purpose the Wright "Whirlwind" engine is employed. The development

The new Dornier Superwal commercial seaplane recently launched at Friedrichshafen, Germany. The machine, which carries twenty-one passengers and a crew of two pilots, one mechanic and a radio operator, is powered with two Rolls Royce Condor 650 hp. engines. There are two cabins separated by a luggage hold, the forward one seating thirteen passengers and the after one, eight passengers.

of this engine was fostered by the Navy, and it is now being widely used commercially not only in this country but abroad.

In the 400-horsepower field a new engine has been designed and delivered by the Pratt & Whitney Aircraft Co., of Hartford, Conn. The engine has been successfully tested on the dynamometer and in flight in high-speed fighting and observation planes.

In the 500-horsepower field both the Pratt & Whitney Co. and the Wright Co. have built new engines, which are now being tested. As a result of these engine developments naval aviation is being placed in a commanding position.

Design

In line with development of types two PN-10's have been constructed at the Naval Aircraft Factory, embodying improvements on the PN-9's used on the Hawaiian flight. With the improvements in wing arrangement and power plant and strengthening of the wings the new planes are able to take off with a full load of 21,000 pounds against 19,600 pounds for the PN-9, and through the improved fuel economy, improved propeller efficiency, and improved aerodynamic efficiency the cruising range has been satisfactorily extended.

The PN-9's, PN-10's and the PB-1's are being organized for long-distance flights to develop navigational methods and the full range possible with these planes. They are being organized into an experimental patrol squadron for this purpose. Such studies are of the utmost importance, as the procurement of new flying boats of large size will be necessary within the next couple of years if the use of such machines for patrol work is to continue in the Navy, and in the meantime experimental operations should be carried forward to gain added information on the potential value and probable nature and use of the type and on the best design to meet the requirements.

To encourage the development of a still more satisfactory training plane a competition is under way covering a combined primary and advanced training plane, which will also be a convertible land and seaplane, together with provision for fixed-gun, free-gun, and radio training.

Specifications governing this combination have been submitted to the trade in conformity with the most recent law governing competitions. By this means it is expected that early in the calendar year one or more planes conforming to these specifications will be available to meet training-plane demands of the Navy and the Naval Reserves.

Studies of metal construction have been progressing. The use of metal is of particular importance in floats and hulls, because of the absence of soakage increasing the weight of the structure and of the ability of metal construction to maintain water-tightness after being dented by floating obstructions which would puncture wooden planking. All recent flying-boat designs have incorporated metal hulls, and a number of metal floats have been tried on seaplanes. Metal wings are being used in some of the recent designs for the Navy, wood having been entirely eliminated from the structures.

Alaskan Aerial Survey Expedition

At the request of the Department of the Interior, the Navy has undertaken the task of making an aerial survey of southeastern Alaska. Plans for the expedition were drawn up in Washington and personnel and material were assembled at the naval air station, San Diego, Calif. Loening amphibian planes, fitted with special T3, tri lens aerial mapping cameras were used. The *Gannet*, a mine-sweeper, acted as tender for the expedition and towed a freight lighter fitted out as a portable photographic laboratory and with quarters for the personnel. The survey was carried out under supervision of the commander in chief, Battle Fleet. The personnel was supplied from the aircraft squadrons, Battle Fleet. The expedition carried representatives from the Geological Survey, Interior Department, who handled the ground control of the survey. The expedition left San Diego May 22, 1926, and arrived in Alaskan waters on June 9. The expedition based on Ketchikan, Wrangell, Sitka, Juneau, and Skagway, and completed the survey of the greater part of southeastern Alaska. The following areas were mapped: Admiralty Island, Chichagof Island, Barnoff Island, Kupreawof Island, Cleveland Peninsula, Revillagigedo Island, Annette Island, Gravina Islands, Duke Island, Prince of Wales Island, Kosciusko Island, Heceta Island, Dall Island, Sukwan Island, and Long Island. During the mapping information of great commercial value was obtained. The expedition completed its summer's work and returned to San Diego in September, having covered in a single summer about three-quarters of the ground tentatively scheduled for three years' work.

"Los Angeles"

In April and May, 1926, the *Los Angeles* made a series of six flights of from 3 to 10 hours duration for the purpose of training personnel and obtaining scientific data for use in designing one new rigid airship. During these flights the ship was equipped with special apparatus designed to show the distribution of air pressures over the hull, control car, and tail surfaces. There were also electrical strain gauges to show the stresses in the girders, and special instruments, including a recording turn meter, recording air-speed meter, and a recording angle and pitch indicator, to show the relation between the motions of the ship and the external pressures and internal strains.

The experiments were conducted with the aid of the National Advisory Committee for Aeronautics.

The *Los Angeles* has completed the calibration of a large number of radiocompass stations on the east coast and has made a number of training flights.

The Aeronautical Board

As early as October, 1916, a joint committee of Army and Navy officers was appointed to consider the development of certain types of aircraft. This committee soon found its jurisdiction too limited to permit of keeping abreast the times, and it was expanded into the "Joint Army and Navy Board on Aeronautic Cognizance." From time to time thereafter the Secretary of War and the Secretary of the Navy added new subjects to its jurisdiction.

The aeronautical board of today is the outgrowth of this beginning and is the agency charged with the investigation and study of all questions affecting jointly the development and employment of the air forces of the Navy and Army. It is specifically charged with the duty of preventing duplication of effort, with providing "sufficiency and efficiency of co-operation and co-ordination," and with originating consideration of pertinent subjects and reporting thereon when deemed necessary.

Reports of the board are made direct to the Secretary of War and the Secretary of the Navy. Its recommendations are advisory only until approved.

Recommendations affecting joint policies or plans for tactical and strategical employment of aircraft, or for the location of air stations, however, are submitted through the joint board for its consideration and recommendation. The board is also required to formulate and submit to the joint board for approval suitable joint Army and Navy aircraft problems to be carried out each year.

The board's precept places the following further subjects under its cognizance:

Coordination of the activities of the Army Air Corps and naval aviation with aeronautical activities of other branches of the Government and with civilian aeronautical organizations; assignment of the development of new types of aircraft, motors, accessories, and weapons to the Army or the Navy; rendering available to either service, whenever possible, training, repair, and other aviation facilities. Plans to prevent competition in procurement and provide for use of surplus material, consideration and recommendation in regard to all estimates for appropriations for the aeronautical programs of the Navy and Army, cognizance of invitations of foreign governments and domestic civilian organizations for participation in aviation activities abroad and in the United States. The issuance of licenses to civilians to operate aircraft in time of war.

Lieutenant Commander Byrd's Flight to the North Pole

The Navy Department granted leave of absence to Commander Richard E. Byrd, United States Navy (retired), for his expedition in the spring of 1926, which resulted in the first flight ever made to the North Pole. Commander Byrd and his companion, Floyd Bennett, aviation chief machinist mate, United States Navy, set out by airplane from Kings Bay, Spitzbergen, on May 9, 1926, and reached the North Pole in approximately nine hours and three minutes, returning to Spitzbergen without having landed.

The expedition was an independent one initiated and commanded by Lieutenant Commander Byrd. It is felt that the successful use made of recently invented and unfamiliar scientific instruments on the trip marks a great advance in aerial navigation. The feat of flying a plane 600 miles from land to the pole and then returning directly to the point of departure without landing for observations is a remarkable evidence of the accuracy of these instruments and of the skill of Lieutenant Commander Byrd. Congress will no doubt make appropriate recognition of this unparalleled achievement.

Bureau of Standards Air Work

In the Annual Report of the Secretary of Commerce, there is reference made to the aeronautical experimental work carried on by the Bureau of Standards. This work, for the most part concerns the development of instruments and the high altitude work which has been carried on by the Bureau during the past year. The following paragraphs, extracted from the report, deal with this work:

Altitude chamber for testing instruments—Progress has been made on the fittings and equipment of a steel chamber which will be used to reproduce in the laboratory the low temperatures and pressures experienced in airplane flight. The size and arrangements are such that the observer may be inside of the chamber during its operation, thus permitting both the test and adjustment of many instruments under conditions encountered in flight. The chamber is designed to obtain low pressures corresponding to an altitude of 40,000 feet and temperatures as low as—20 deg. C.

Aeronautic instrument specifications.—In cooperation with the Army and Navy Air Services a general revision of the specifications for aircraft instruments has been completed. This work involved the revision and amplification of 23 specifications and included experimental work on a number of types of instruments for the purpose of establishing tolerances.

Improvements in aerial mapping—Surveying by aerial photography is a war-time activity of supreme importance. Peacetime surveying by the same method, for the purpose of mapping areas and contours of watershed, woodland, etc., has become an important commercial activity. One of the greatest difficulties to overcome is the distortion which the very best photographic lenses introduce, especially the lenses used for enlarging the original photograph. The bureau has succeeded in practically eliminating this distortion without introducing other harmful aberrations, by inserting at the proper place in the camera a plate of glass of proper thickness. This device reduces flying time to about one-half that necessary before.

Change of Address

The Editorial and Publicity Offices of The Gardner Publishing Company, publishers of AVIATION, WHO'S WHO IN AMERICAN AERONAUTICS and THE AMERICAN AIRCRAFT DIRECTORY will be after

Jan. 1, 1927

The Fisk Bldg., Broadway at 57th St.

Varney Air Mail Service an Operating Success

Report on Five Months' Operation—Salt Lake City to Pasco

ON OCT. 21, the first five-months' operation of the Varney Air Mail Service over their contract air mail route, C.A.M.5, from Pasco, Wash. to Salt Lake City was completed. This route is one of the most difficult mail routes in the country. The Varney line has flown 1463 hr. with its six Swallow mail planes equipped with Wright Whirlwind engines, the total cost of replacement parts for the engines being, during this time, only $41.15, which is less than $7.00 per engine. Three of the planes have flown approximately 30,000 miles each and their total mileage is approximately 146,000 miles.

This mail route originally had its southern terminal at Elko, Nev., where connection was made with the trans-continental route. In September, the southern terminal was changed to Salt Lake, which added about 100 miles to the route but gave the Varney Company a better opportunity for passenger carrying and also general commercial work for their standby plane. The present route from Salt Lake to Pasco is 520 miles, the terrain covered being most unusual. Pasco, the northern terminal, is at sea level and Salt Lake is approximately at 5,000 ft. altitude. Two high mountain ranges are crossed by the route, one, covered with perpetual snow, being crossed at an altitude of about 12,000 ft.

A Change of Engines

When the line was first started water-cooled Curtiss C-6 engines were being used. It was found, however, that these engines did not have the power to carry the load at the speed and altitude required. It was decided, therefore, to install more powerful engines and a 60-day extension was approved by the Post Office Department. The order for Wright Whirlwind air-cooled engines was received by the Wright Company on April 14 and the engines were shipped by express, arriving at Boise on April 20, less than a week from the time the order was placed. The Varney Company installed the engines in the planes themselves and made very good time on the installation. The first plane was ready for ground test by May 6 and was flight tested on May 8. Comparative trials were made with the first plane equipped with a Wright Whirlwind engine and one of the planes in which the 160 hp. water-cooled engine was still installed. The air-cooled engine went to 20,000 ft. and was still capable of climbing when the pilot brought it down because of the extreme cold. The ceiling of the water-cooled engine plane was 10,000 ft. The Wright Whirlwind engine turned the 9 ft. diameter by 6 ft. pitch Curtiss-Reed propeller at 1775 r.p.m. in the air and 1550 r.p.m. on the ground.

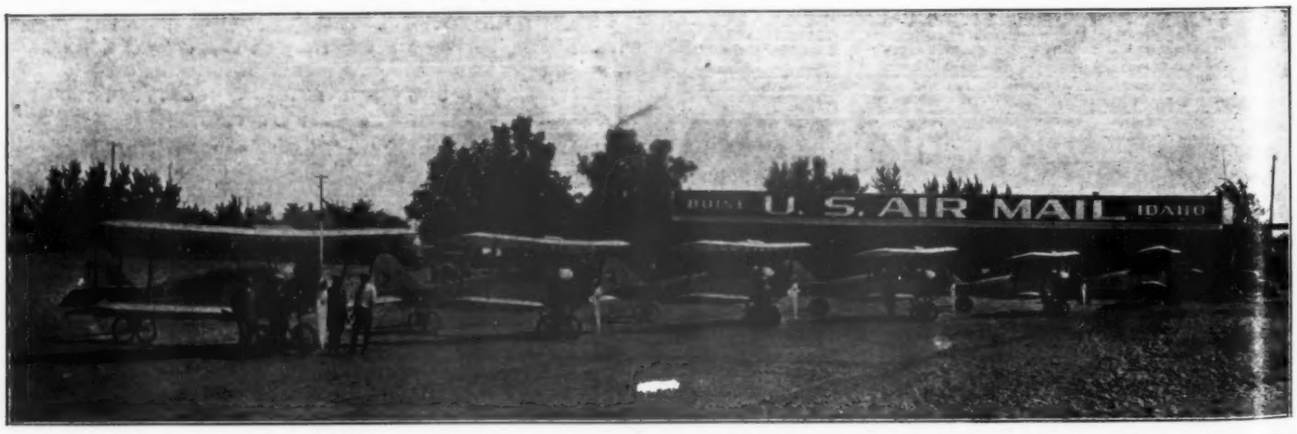
The fuel and oil consumption of the Whirlwind engines in these Varney mail planes had been excellent. During the month of June the gasoline consumption was 10.2 gal. per hr. During the very hot weather of July and August the gasoline consumption reached 11.4 gal. per hr. The oil consumption has averaged 2 qts. per hr.

During this splendid hourage of 1463 hr., there have been very few even minor troubles encountered on either planes or engines. Two planes were nosed over in taxiing on landing fields. In doing so a metal propeller was bent and a wooden propeller broken. After grinding valves on one engine a piston was cracked in the reassembly. This was not noticed until it let go in flight some hours afterwards. The pilot continued to fly until he came to a landing field where he set the plane down safely. In these 1463 hr. of flying, the total replacement of engine parts has been the piston referred to above, one rocker arm, two push rods, one set of ignition wires and one carburetor float. No other replacements have been made of any kind, not even valve springs, valves or valve guides. The valves were re-ground at about 175 hr. None were blowing at that time but it was thought better to grind before that time was reached and before loss of compression or revolutions was found. Type IXB extra gap B.G. spark plugs were used with fine success during the hot Summer weather and A.C. bar type plugs are being used with excellent success now that the weather is cooler. The Scintilla magnetos have never given any trouble whatever. The hourage to Oct. 21 on these planes and engines is given below. The engine with the small hourage is a spare which has only been used occasionally:

Engine No.	*Operating Time*
7218	318 hr. 30 min.
7216	301 hr. 20 min.
7217	295 hr. 15 min.
7215	289 hr. 00 min.
7219	206 hr. 55 min.
6999	52 hr. 40 min.

The territory served by this route is interesting. Pasco, the northern terminal, is a railroad center located a short overnight journey from three important cities. It is only 180 miles from Spokane, 160 miles from Portland and 120 miles from Seattle. A plane leaves Pasco early in the morning, after the arrival of the eastern and southern mail from these three cities. The northbound plane arrives at Pasco in time for night connection to these cities. At the southern terminal connection is made with the trans-continental Air Mail route and the Salt Lake-Los Angeles route.

At cruising speed, the Swallow planes make approximately 102 m.p.h. so that the hourage flown gives a mileage of greater than 146,000 miles; which is equivalent to the mileage of 54 trips by air from New York to San Francisco or about six times the distance around the world. The fuel consumption has run from 9 to 10 miles per gal. These are transportation facts which are of as much interest to all transportation line operators as to the aeronautical fraternity.



Five Whirlwind engined Swallow mail planes of the Varney contract service, operating between Salt Lake City and Pasco. The machine on the extreme right is a Curtiss C-6 engined Swallow.

Constructing and Merchandizing the Eaglerock

Alexander Aircraft Co. Pioneers in Part Payment Plan for Airplanes

UNDOUBTEDLY ONE of the most interesting stages in the development of the civilian aeronautical industry was reached a short time ago when it was first announced that the Alexander Eaglerock three-seater commercial and private ownership airplane was to be placed on the market on the well-known part payment system which has become so common in the automobile and other sales fields. The Alexander Aircraft Company of Denver, Colo. is a pioneer in launching such a scheme in the aircraft industry and there is little doubt that the system will work out satisfactorily, as it has done in all other fields, both to the advantage of the Alexander company and to the purchaser.

The Part Payment Plan

In explaining the new purchase plan applied to the Eaglerock, J. Don Alexander, president of the Alexander Aircraft Company, has written as follows:

> Eaglerocks will now be sold through the popular American plan of easy payments. Any responsible person desiring one of these planes has only to express his desire to the local Eaglerock dealer or to the factory at Denver, Colo. An application form will then be supplied to him on which he will tender adequate references as to his responsibility, paying at this time $100, an amount necessary to carry the cost of the initial investigation and as evidence of good faith on his part.
>
> Should his application be accepted, the $100 will be applied to the initial down payment of 30 per cent of the price of the machine. The time payment selling price is 11% higher than the regular list price, the additional charge being made to cover brokerage, interest, insurance risk, collection expense, etc. The balance will be divided into ten equal monthly payments, the first of which will be due 30 days following the approximate delivery date of the airplane.
>
> In the event that application for purchase is denied, the good faith deposit of $100 will be returned to the applicant in full.
>
> This ten-payment plan of purchase allows any individual, providing he will operate his airplane and business in an efficient manner, to pay for the machine out of its earnings. This contention is based upon reported earnings of our dealers and other pilots with whom we have close contact. It is not unusual for a flier to take in $150 to $350 over a week-end. A pilot able to operate his plane a full seven days in the week should complete his payments in a much shorter period of time than the part time operator.

In connection with this new sales plan, which has now been in effect for the past two or three months, considerable expansion has been carried forward in the Alexander airplane manufacturing plant. Five additional buildings are being added and the original crew of fifty workshop hands is being increased to more than double. Last September, the production of Eaglerocks was two per week and this schedule is gradually increasing to four per week in order to keep up with sales.

During his tour of the airplane factories throughout the United States last Summer, Mac Short, an aeronautical engineer of the Massachusetts Institute of Technology, visited the Alexander Aircraft Company of Denver, Colo. having looked forward with considerable interest to the opportunity of seeing the mile high city and the aeronautical operations going on there. He found a true family spirit within the organization of the Alexander Industries in which no small interest was displayed in the activities of the Aircraft branch.

Although the factory is but a year old, a very systematic production schedule has been established, with coordinated planning, engineering, inspection and procurement departments. The present production is going through with perfect regularity and, according to J. A. McInaney, sales manager, the sales department has the production of the plant sold many weeks ahead.

A Higher Powered Eaglerock

During his visit and inspection, Mr. Short was requested to carry out some engineering tests and investigate certain structural features of the Eaglerock. It is planned to install, at a later date, a higher powered engine in the Eaglerock and, therefore, check calculations and tests were made on some of the structural members to insure a positive margin of safety. The critical loadings on the control surfaces were calculated and checked against the design size of the members in that system. The control wires, aileron crank mechanism, etc. showed a satisfactory margin of safety over and above the design load factor. The wing ribs were subjected to a medium incidence static test and a typical rib failed at 185 lb. load. However, in order to give the rib more lateral support, two small diagonal members were added to the web bracing. This change produced a rib which carried a 240 lb. load with an increase in weight of the wings of but 6 lb. This latter rib

The Alexander Eaglerock three-place plane (Curtiss OX-5, 90 hp.)

Another view of the three-place Alexander Eaglerock (OX-5)

is being incorporated into the design as rapidly as possible and will support a load that covers the specifications for ribs. In the course of the tests, six different ribs were built and tested, the sixth one carried 360 lb. and weighed 7½ oz., giving a strength weight ratio of 48. Mr. Short recommended that this rib be used on the short winged planes which will be powered with engines of 150-200 hp.

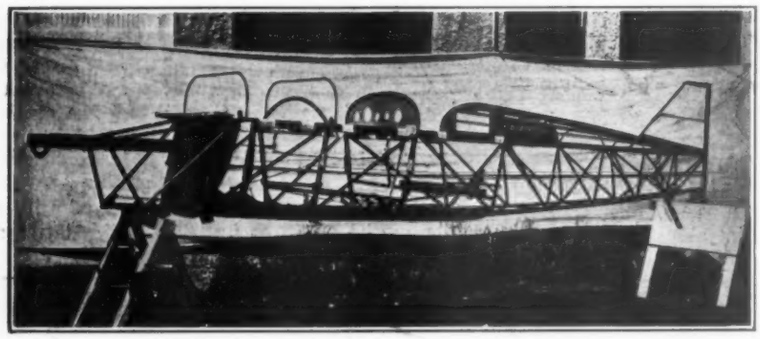
A further recommendation was that the drag struts within the wings be constructed so that they would resist torsion to a greater degree and this change will also be made in the near future. A review and check of the fuselage and landing gear design was also made, but, due to limitations in time, a complete analysis of the fuselage could not be conducted. However, a rough check of the loads that the members could carry appeared to show that, in the main, the fuselage was overstrengthened. The type of construction used on the Eaglerock fuselage is quite satisfactory, rigidity being secured by the use of steel tubing for the transverse, longitudinal and bulkhead bracing.

The landing gear loads were computed and checked against the strength of the tubing used. The present method of filling the landing gear Vees with spruce brings the strength of the struts up to the desired factor. Further calculations were prepared for a new type of gear which is to be installed at a later date. The primary object of this new gear is to give the airplane improved taxiing qualities and make it more readily detachable.

Mr. Short relates his first impressions of the flying qualities of the Eaglerock when, as a guest of Mr. Alexander, a cross-country trip from Denver to Wichita was made. The airplane flew through the bumpy Summer air smoothly and showed good directional stability. The landing characteristics were good and the flying qualities were equally as pleasant.

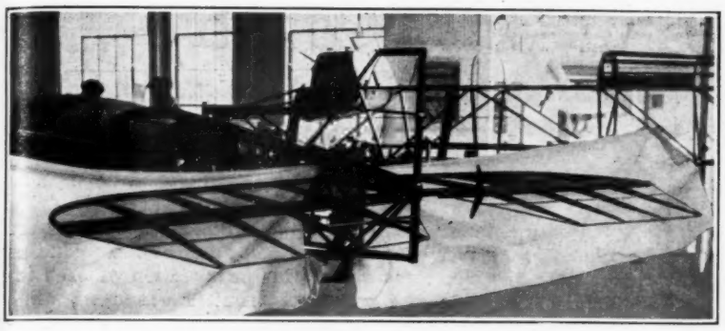
Constructional Details

The fuselage of the Eaglerock (Curtiss OX-5) is of steel tube construction, welded at all joints. There are no wires used in cross bracing, a Pratt type truss being employed. This makes a fuselage that is unaffected by high initial tensions, or too low tensions in wires, and one which will stay in alignment. Special consideration is given to the distribution of landing loads, and of giving ample strength to the members affected, as it is known that a commercial plane must stand considerable abuse by students and must sometimes fly from very poor fields. The tubing used is of the commercial grade, readily obtainable in this country. This means that, in case of repairs, time will not be lost waiting for alloy tubing. Light steel tubes, bent in the form of bows, support the cowling and turtle deck. This construction eliminates much of the weight often found in these members.

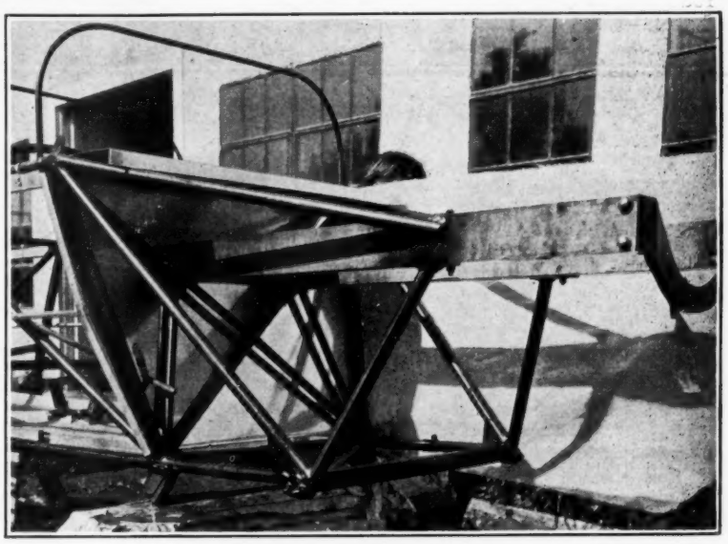


(Above) The fuselage framework of the Eaglerock giving an excellent idea of the general constructional details. The simplicity of the structure is clearly shown.

(Right) A general view of the erecting shop of the Alexander Aircraft Company of Denver where the quantity production of Eaglerocks is in progress.



(Left) The tailplane structure of the Alexander Eaglerock and (below) a closeup of the engine mount showing the wooden bearers and the position of the protective firewall in the rear.



The engine bed is a simple triangulated structure, very efficient in distributing the torque and thrust loads to the fuselage. A built-in fire wall separates the engine compartment from the rest of the fuselage.

The major portions of the wood parts of the Eaglerock are spruce, but other varieties of wood are used in members that demand other qualities. The engine beds are of hard maple because of its great compressive strength; the wing tips are of ash, because of its strength in bending; the wind butts, seats, flooring and baggage compartments are of waterproof plywood.

The wing spars are of spruce and are laminated of two pieces formed into a beam section 18 ft. long, and glued in heavy gluing presses to insure perfect contact. After a sufficient time has elapsed for drying, the spars are taken from the presses and stored in racks for two weeks to allow for shrinkage and seasoning. They are then shaped into spars, after which they are again stored to air-season so that all shrinkage will be done before assembly in the wings. The parts used in the construction of the wing ribs are cut out in large quantities to insure perfect seasoning.

There are sixty-eight ribs used in the Eaglerock, seventeen to each wing, spaced on twelve inch centers. As there is an aileron on each wing, there are ten long ribs and seven short ones. The ribs are of the Clark Y section of a chord of 60 in. and are constructed in jigs. When completed, these ribs weigh 7.25 lb. and stand a sand test of 302 lb. After inspection these ribs are placed in a wing jig which spaces them accurately so that the spars and the leading edge may be pushed into place. The wing hinges are first bolted on and clamped into place on the jig. These clamps hold the spars in the same relative position they will occupy on the completed plane, and thereby permit accurate rigging without developing strains and stresses in the wings. The compression struts and the drift wires of No. 9 steel wires are then put in place and tightened. This permits accurate trammelling before the ribs are fastened to the spar and does not develop undue stress in the wings. The wing butts and tips are then built on to the wing ends.

Aileron Control

The ailerons are controlled by wires from the horn on the control stick to a "T" crank, mounted on the front beam of the lower wing near the end. One arm of the crank is connected to a balance wire, which also runs inside of the wing. The third arm on the "T" is connected to the lower aileron by means of a steel tube. Finally, the upper and lower ailerons are connected together by a streamline steel tube strut.

The engine cowling is sheet aluminum, re-enforced where stress occurs. The cowl is hinged on top similar to that of an automobile so that a section on each side easily lifts up for inspection, oiling and repairs. Header tanks are on the inside. The radiator is equipped with streamline shutters operated from the pilot's cockpit.

The radiator is of honeycomb type, with 7 in. core. The core is manufactured by the U. S. Cartridge Company, whose radiator activities have recently been acquired by the Winchester Arms Co. It is 19 in. in length, 9 in. in depth, weighing 36 lb. Its capacity is about two gallons. The shutters are of Alexander manufacture and are controlled from the pilot's cockpit. The shutters are so constructed that if an individual flap gets out of adjustment it will automatically open itself, thereby making sure the engine cannot overheat. A header tank, installed above the engine and connected up with the radiator, holds two gallons of water, making a four gallon capacity cooling system.

A 45 gal. gasoline tank is standard equipment, giving 5 hr. full throttle endurance and from 6 to 7 hr. at cruising speed, which is 85 m.p.h.

The tail surfaces are of steel tubular construction with the exception of the ribs, which are of wood. They are externally braced with streamline steel tubing. Ample sized fittings connect the stabilizer to the fuselage. The fin is an integral part of the fuselage. Elevator control wires are separate and are outside the fuselage in order to facilitate inspection.

The fuselage is built up and welded in metal shop and the landing gear and wheels attached. It is then sent to the final assembly shop where the engine is installed, cowling placed on, instrument board and controls installed, after which fuselage is covered, doped and painted. The wings, meanwhile, have been covered and doped, ailerons attached and the machine is ready for final assembly and rigging.

In the process of manufacture, a pilot inspector now goes over every fitting, examines controls, etc., and after being checked up, the machine is taken to the field and assembled. The test pilot then inspects the plane and takes it up for a test flight. He puts it through stunts of every kind and after pronouncing it O.K., it is turned over to the Aircraft company for delivery.

An Air Service to Ocean Liners

The Imperial Airways of Great Britain plans next year to operate an air service between Southhampton and Cherbourg to run in connection with the trans-Atlantic liners.

Twelve-seater Supermarine "Swan" flying boats will be used and it is anticipated that a full day will be saved both in the inward and outward trans-Atlantic journeys.

Air Disturbances in Hilly Country

Wind Tunnel Tests Indicate How Pilot May Make Use of Natural Air Turbulance and What Regions to Avoid When Flying

ALL PILOTS who have flown over mountains or hills on windy days are aware of the existance of violent vertical currents of air tending to disturb the steady motion of the airplane. These vertical air currents are frequently so regular in their association with the general contour of the ground over which they are to be found that pilots who fly a route regularly even become accustomed to their presence and position, but there are few pilots who can fly over a region which is new to them and yet have a fair idea of where they will meet bumps and of what nature the bumps will be. Yet, the whole subject of the relation between the contour of the land and the state of the air flow over it is of very considerable importance to all aspects of flying.

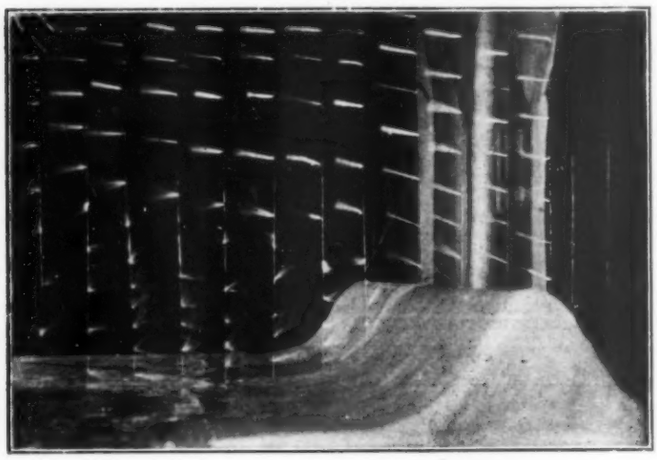


Fig. 1.

It is probable that no man has made a more complete study of the air currents to be found in mountainous regions than has the now well-known Lieutenant Thoret, of the French air service. Lieutenant Thoret has frequently, by preference, flown over regions of violent air currents and has even been known to take advantage of conditions in the air which might be the dread of many pilots. It will be recalled that in 1922, Lieutenant Thoret drew worldwide interest when he remained in the air for seven hours in an ordinary airplane with the engine completely shut off, making use of the air currents in the region to support his machine. Since then, he has been carefully studying air currents in mountainous regions and has recently had the opportunity of verifying his observations by a series of experiments carried out in a wind tunnel by means of placing models of mountains and hills in the air stream and visualizing the air flow patterns.

Tunnel Tests-

Plaster models are, of course, far more regular than a natural mountain but such models serve very clearly the principles which are difficult to explain in the full scale because of irregularities in the outlines of natural hills and mountains which set up air currents that are hard to interpret. The experimental method used in these particular tests was to place models of regular hills and mountains in the wind tunnel on a flat surface. A series of vertical wires was arranged at a number of points both in front of, over and behind the model hill with a large number of small pieces of silk thread attached at various heights up each wire. When the wind is turned on with such a set up, a very clear visual pattern of the airflow across the hill is provided, giving an indication of the direction and even the continuity of the wind at any one point.

Both instantaneous and time photographic exposures were made for a number of models of hills. In the instantaneous exposures, the silk threads indicate the direction of each individual streamline at the time the shutter was open, while in the case of the time exposures the actual extent and maximum limits of the changes in direction of each individual streamline are indicated by the extent of the blurs corresponding to each thread. At the same time, the points where the air flow, while perhaps of changed direction, is, nevertheless, smooth and steady, are indicated clearly by the almost complete absence of blurring effect.

Air Flow Over Hill

The photograph reproduced in Fig. 1 is a time exposure of ½ sec. in a wind of 40 ft. per sec., the model being 6 in. high. A careful study of the picture shows a strong and comparatively steady current flowing upward in front of the model mountain, this upward flow continuing in steadily behind the mountain and extending its influence up to three or four times the height of the mountain. The distance to which the air is disturbed behind the model is not shown in the photograph but it extends in a very noticeable manner to a distance greater than fifteen times the height of the hill. Behind the mountain and below the fairly steady flow of rising air there is a region of extreme turbulence which in general takes the form of a whirlpool of air in the vertical plane. In other words, the air which rises over the forward face of the mountain does not follow down the far face but continues upward and horizontal for some distance before it starts its downward course. In very irregular fashion the air sweeps downward and then travels towards the mountain in a direction opposite to the normal air stream over the mountain. Along the face of the mountain away from the wind there is an upward trend of air but it is violently disturbed and would be extremely treacherous for flying.

A flier travelling parallel to a range of mountains in a side wind will find a decidedly helpful current if he flies fairly near and slightly above the windward crest. If he flies on the

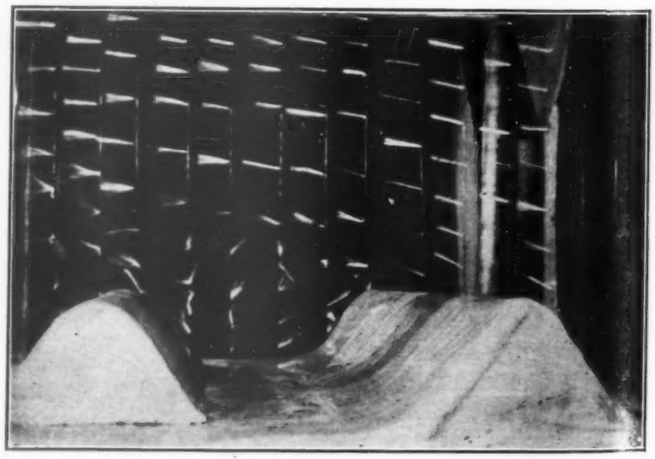


Fig. 2.

leeward side, he will be in a region of extreme turbulence which might even be dangerous. At a distance behind the hill, usually greater by a considerable amount than its height, the pilot is sure to find violent down currents. As already stated,

these may extend up to several times the height of the hill and a long distance back.

Approaching mountains, or even small hills, from the leeward side is apt to be really dangerous, unless at sufficient altitude. The wind tunnel tests show that a pilot approaching a hill in such fashion may be bucking a strong head wind and suddenly be thrown into a strong downward current, and then he may meet a following wind flowing towards the mountain and in the opposite direction from that higher up. If the mountains are high and the wind strong no amount of reserve power would keep the airplane in the air. It is, thus, dangerous to fly towards the leeward side of a hill into the wind unless the plane has sufficient altitude easily to clear the crest.

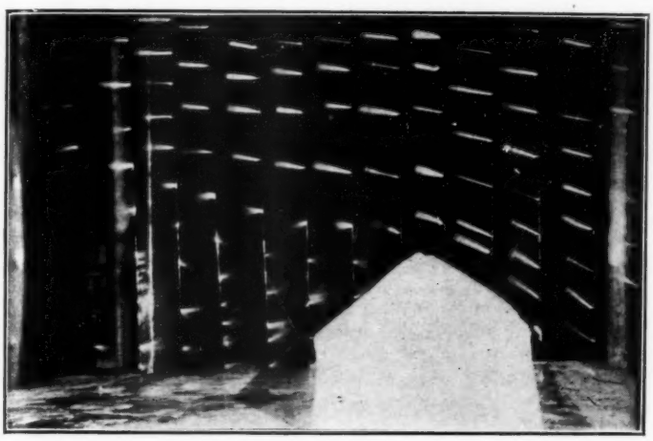


Fig. 3.

In Fig. 2 the turbulent conditions in a valley are shown. The pilot flying down this valley in a cross wind should keep near the left hand crest where he will be helped by the upward currents even though the air would be rough. The wind tunnel shows conditions of turbulence in the valley but there was no method of gauging the speed of the turbulent air and, where the valley is narrow and deep with a flat bottom, the velocity of the movement may not be very great.

The conditions behind a hangar are clearly depicted in Fig. 3. The down gusts and turbulence in this case are not very large in extent but their existence probably accounts for accidents in which a normal glide has been upset by an eddy back of a hangar.

In Actual Flight

In actual practice, neither are mountains sufficiently regular nor the wind sufficiently steady to enable an accurate forecast by a pilot of the conditions he may expect when he reaches a certain area ahead. But if pilots would carefully observe conditions as they meet them and generally make a study of air flow over mountainous regions, not only will they find flying during long cross-country flights less monotonous but they may often be in a position to make valuable use of what they have learned by observation and experience. It is reported, for example, that Lieutenant Thoret flew a seaplane for twenty-five miles with the engine stopped by taking advantage of the rising air currents along a range of mountains.

Less spectacular but equally as practical are cases in which pilots flying in a strong cross wind have been able to reach their destination without running out of fuel, though this was otherwise threatened, by means of taking advantage of rising currents. There is another interesting case cited of a Captain Girier also of the French Air service, who had been repeatedly trying to reach the summit of a particularly high mountain in Persia from an airdrome on the leeward side. In all his attempts he was unable to attain sufficient altitude until, recalling what might be called Thoret's teaching, he went around to the windward side of the mountain and there attained the necessary height with ease.

The R-33 to be Scrapped

It has been announced that the British rigid airship R-33, which is practically a replica of one of the German war raiders, L-33, which was shot down at Little Wigborough, Essex, England, Sept. 24, 1916, is to be scrapped.

This airship was completed and accepted for service in June, 1919. For a year after being commissioned the R-33 was at the disposal of the Navy, and in the Summer of 1920 was overhauled and used in conjunction with the mooring mast experiments then being conducted at Pulham.

The R-33 has made many notable flights, and it will be recalled that it was this ship which, early this year, broke away from the mooring mast in a gale, much in the same way as did the Shenandoah. Recently she has been used for experimental purposes and on two occasions she has flown with planes suspended beneath her for the purpose of trying the possibilities of releasing and reattachment of airplanes to airships during flight.

The airship is 639 ft. in length, 78 ft. 9 in. in diameter and 91 ft. in height.

Further Improvements in Mail Schedule

Arrangements with the Pennsylvania Railroad Company for the stopping of a fast train, leaving the Pennsylvania Station in New York at 11 a.m., at New Brunswick, N. J., the air mail terminal will permit the moving up of trans-continental air mail dispatch 1 hr. 30 min., it has been announced by Postmaster General New. The change in schedule became effective on Dec. 15.

Under the present schedule, mail destined for air mail dispatch leaves the Pennsylvania Station by train at 9:35 a.m., while the closing time is 8 a.m., making it almost imperative that mail be deposited the preceding evening in order to make connection with the transcontinental air mail. The new schedule will permit mail prepared the same morning of dispatch to catch the westbound plane.

No change will be made in the trans-continental schedule West of Chicago. The difference will be made up between that city and New York with the faster Douglas mail planes now in use. The arrival time in San Francisco will be 4:30 p.m., the following day, as at present.

Air Mail Schedule Revised

An announcement of a change in the flying schedule on the contract air mail route, between Chicago, Minneapolis and St. Paul, has been made by W. Irving Glover, Second Assistant Postmaster General. This change was made to permit additional time for daylight flying.

The new schedule is as follows:

Contract Air Mail Service—Schedule Change: Effective Dec. 6, 1926; C.A.M. 9.

Leave Chicago, 5:50 a.m.; leave Milwaukee, 6:50 a.m.; leave La Crosse, 9:30 a.m.; leave St. Paul, 11:30 a.m.; arrive Minneapolis, 11:40 a.m.

Leave Minneapolis, 1:00 p.m.; leave St. Paul, 1:10 p.m.; leave La Crosse, 2:30 p.m.; leave Milwaukee, 6:00 p.m.; arrive Chicago, 7:00 p.m.

Same frequency as heretofore.

Goodyear Develops Airplane Snare Screen

An airplane "snare", with which any city might be surrounded, is now being produced for experimental purposes, by the Goodyear Tire & Rubber Co., of Akron, Ohio.

The snare is constructed of small hydrogen-inflated balloons, anchored by steel strands in an impenetrable network, which could throw about a city a fence 18,000 ft. in height. The balloons would be released and allowed to ascend above the clouds, so as to be visible to planes. Their suspended wires would prevent the passage of airplanes through the line.

Three experimental balloons, of 6,000 cu. ft. gas capacity, were sent to Fort Monroe Nov. 19 for Army experiments.

Further Discussion on Metal Propellers

Twisted Duralumin Propellers Not Basically Weak. Minor Change Will Prevent Fatigue Limit Being Reached.

IN THE issue of AVIATION of Oct. 25, T. P. Wright, in an article on the durability of metal propellers discussed certain individual failures which had occurred. This article and the subject in general aroused an appreciable amount of interest and correspondence on the subject was published in the Nov. 29 issue. The subject is of such vital interest that the comments contained in two further letters recently received are of value. The metal propeller is in such extensive use both in commercial and in service flying and will undoubtedly grow even more indispensible in the future that the subject is of primary importance.—EDITOR.

To the Editor of AVIATION:

In view of the articles in "AVIATION" by Mr. Wright of the Curtiss Co. and Mr. Noorduyn of the Fokker Co. on the subject of failures of metal propellers, I feel obliged, quite reluctantly, to give my personal views on the subject, which may differ somewhat from either of these engineers, who are not only experts on the subject but are known to be friendly to metal propellers.

The controversy is ostensibly on metal propellers generally, but really it is on the subject of the Reed single piece, solid blade propeller of duralumin type alloy, and of the original D model, made from a rolled plate twisted at the center in order to establish the high angles at the roots of the blades. Of these at least 1500 are in actual flying service here and abroad, and probably over 100 have had over 500 hours of flying service, and probably 500 have had 200 hours of such service. Total failures have been 5 (no casualties) but of these only three are undisputed as to responsibility of the propeller. Examination of propellers returned for inspection has revealed, in a few, incipient cracks radiating from the bolt holes, near the longitudinal axis of the propeller, which cracks might later on lead to fracture.

Including these propellers it may be positively affirmed that nearly all the failures actual or incipient have been in that region of the propeller. It may also be stated that these have nearly all been confined to one particular size of propeller made for one particular engine and plane, and only after a very large number of hours of service. The figures given above indicate that the ratio of failures to propellers in service is less than 1 per cent.

The Curtiss Co., has wisely requested the return of propellers of the old Type D for inspection, after they have flown a stated number of hours.

Both of the engineers referred to say that the new R Type Reed propellers with forged center are free from the danger of failure, but both appear to acquiesce in the position that the D Type, with central twist, is inherently and inevitably of limited life, and is not capable of sustaining vibration without damage, and that position is the one which I positively challenge, and I maintain on the contrary that, if a single error in one design is corrected, the old Type D with twisted center has an unlimited life and can defy vibration.

That is to say, the failures were due solely to one particular error in design.

Now this error consisted merely in having too little thickness in the hub region in a design which had to meet the conditions of large power absorption, slow engine revolutions and limited diameter, the blades being therefore increased in area and consequently in weight. But the central hub portion of the propeller was not proportionately increased in thickness. An increase of less than ¼ inch in thickness in that region would have made these propellers fatigue proof and vibration proof, and would not have added more than about five pounds in weight.

The above applies to two of the three failures. Regarding the third, Mr. Noorduyn's case, and also the one with incipient cracks, in this design an increase of 1/6 in. thickness in the hub region would have made these propellers vibration proof and would have added about 2½ lb. weight. The thickness was ample for ordinary conditions, and the excessive vibration from overlap could not reasonably have been anticipated but could have been easily provided against as described above.

The subject of metal fatigue has been very exhaustively studied by metallurgists and various Government Bureaus here and abroad, and for each metal or alloy there is an official figure for fatigue stress, and if the metal is not stressed above this figure, it will not be affected by the vibration, no matter how long continued. Otherwise there is no meaning in the word "Fatigue Limit." Engineers all over the world are basing designs on these figures, for bridges, machinery, marine construction, ordnance, and many others. For the duralumin class of alloys the figures usually given are about 55,000 pounds breaking stress, 35,000 pounds elastic limit, and 15,000 pounds fatigue limit. In making my propellers, for a greater margin of safety, a stress of 10,000 has been taken as fatigue limit. It is therefore necessary only to provide enough cross section to insure that the maximum stresses will not exceed 10,000 pounds per square inch, and then the propeller is vibration proof and its life is unlimited.

Now there is but one section of the Reed propeller Type D where there is any possibility of exceeding this unit stress, and that is the very section where the breaks have actually occurred, and the circle of bolt holes, especially when they were not reamed, has greatly aided in initiating the cracks. In other words a small region of these propellers, near the longitudinal axis, and within the six inch blade radius, has been stressed over 10,000 pounds per square inch, which, though far below the breaking stress or the elastic limit, is above the so-called fatigue limit, therefore at this place there might be a gradual deterioration of the metal, so that after a certain number of service hours, say 500, the metal might yield, provided it is subject to much vibration.

I believe this was the only cause of these failures and that the fault is one easily corrected by a moderate increase in the cross section in this particular region of this particular design.

Now if an error in the design is the cause and the only cause of this 1 per cent of failures, who was responsible? As I have a certain right of control over the designs of my licensees, I must share the responsibility together with other aerodynamic engineers, including those of the U. S. Government who long ago approved the designs. The only alibi is that apparently no one has yet been able to calculate mathematically just what is the distribution of stress across the propeller section in the region named. We know what is the total stress on the section, and if there were a uniform distribution of stress it can easily be shown that such would never exceed about 5,000 pounds per square inch in the sections actually used, and this is far below the fatigue limit.

But it is now quite evident that there is a concentration of load near the longitudinal axis of the blade, which may reduce the stress at the outer portions of the section and increase it at the center.

The necessary increase of thickness in this region is easily made, therefore my contention is that the twisted center type D is not inherently weak, and that, as now designed and made by all my licensees, with adequate cross section in the hub region, the life of propellers of Type D is unlimited, and that they will stand any service vibration indefinitely, and that periodic inspection is not necessary.

The new type R, with forged center, was developed by me personally several years ago, and, after overcoming many pioneer difficulties in manufacture, was then turned over to my licensees. The Curtiss Co., showed a prompt appreciation of its merits and took energetic measures to put it into production. It has a large excess of section in the hub region and is free from the weakening influence of bolt holes. The Cur-

tiss Co., are quite right in offering it as superior to Type D. But I am merely protesting in this letter, respectfully and mildly, against the inference one might draw from the Curtiss circular and from the articles by Mr. Wright and Mr. Noorduyn that Type D is necessarily and inherently weak.

Of course we are all accustomed to failures of wooden propellers, so the failure of a wooden propeller is taken as a matter of course and excites no special comment. Furthermore after 100 to 150 hours of flying service the wooden propeller is usually retired for inspection and repair, and perhaps permanently. But the propellers of my type have set a new standard of perfection, so that even a single failure after 500 hours of flying service is an important and serious event.

S. A. Reed.

Failures Not All-Inclusive

To the Editor of AVIATION:

I have been somewhat interested in the discussion between Mr. Noorduyn and Mr. Wright which has been appearing in the late issues of AVIATION, so I would like to put forth an opinion or two of my own.

I would take from the discussion of both Mr. Noorduyn and of Mr. Wright that metal propellers have limitations which to my mind are too low. To give a hint as to what I mean, I would like to suggest that the metal propellers to which both the afore mentioned gentlemen refer are not the only metal propellers being made and used at this time, so, the limitations mentioned should be clearly applied to the propeller that has shown these defects.

The metal propeller I am thinking of is made here in Pittsburgh [Standard Steel Propeller—ED.] so interests me greatly. In fact, the illustration of the flying boat on p. 913 of AVIATION clearly shows the metal propellers with which it is equipped.

It may seem as though I am somewhat long winded in getting to the point but here it is; these propellers, so far as I have been able to ascertain, have never been known to fail under service nor have they ever given any trouble of any sort. I have hopes that they will continue to act in the same way and from all indications, it would seem as though they will do so.

I may state that these propellers have been used by the Army and the Navy for several years, so are out of the experimental class. In fact, the plant is running day and night, seven days a week.

I am not quite sure just how many times these propellers may have been used on tri-motored planes, especially ones in which the propellers overlap; the only case coming to my mind at the present being the ill-fated New York-Paris plane. However, these propellers have been used often enough under most of the other conditions to indicate long life and trouble-free life at that.

I may be somewhat late with any further discussion of the propeller question, but I think it is no more than fair that a propeller that is passing the Army and Navy tests with flying colors should at least be mentioned as not coming under the list of failures which silence on behalf of this propeller might imply.

If I may be wrong in any of my claims, I would appreciate any information you might care to divulge. Until then, I hope you will indicate to the readers of AVIATION or at least to the gentlemen in the controversy by any means you wish to use, that the failure of metal propellers as indicated applies to one make only.

Arthur D. Sallee.

A French Airplane Safety Contest

A competition to increase safety in airplane operation is being conducted by the "Union pour la Securite en Aeroplane", 35 rue Francois ler, Paris. Entries for 1926 will be received until Dec. 31. The chief items in the competition are as follows: Apparatus to signal the beginning of fires; apparatus to extinguish fire, employing only non-dangerous products; apparatus permitting landing in foggy or misty weather; light engines operating on heavy oil; and apparatus permitting use of a detachable cabin furnished with a parachute.

Letters To The Editor

Pilot Who Jumped Vindicated

The accident to the Pacific Air Transport Company's mail plane on Nov. 12, where the pilot jumped and landed safely by means of his parachute, and where the passenger was killed, has aroused so much comment that the following statement from the company will be of interest. The reinstatement of the pilot by the Post Office Department is a vindication of his action, which should put an end to any further criticism. The statement of the company follows—EDITOR:

To the Editor of Aviation:

The pilot in charge of the plane at the time was Mr. Charles Widmer, an experienced and careful pilot. He started his trip at 12.01 a.m., on a very bad night while it was dark and storming. They had been having showers there most of the day. Mr. Donald Rossiter, a pilot, had requested free transportation north, because he was a former employee of ours. This was granted him. When the two men started they were provided with parachutes, which were strapped to them and the operation was explained to them, although both knew how to operate them. Leaving the field, the pilot ascended to an altitude of 1800 ft. into a storm, which he intended to climb through. About five minutes later, when he reached an altitude of 3800 ft. the plane got beyond his control from the storm and went into a tail spin. He judged himself to be over the Hollywood Hills and realized that in order to save their lives, Rossiter and himself must jump quickly. He called to Rossiter three times to jump and felt sure that Rossiter understood him. On the third call he motioned to Rossiter with his head, indicating that he was going overboard and he said that Rossiter evidently understood, because Rossiter turned around to the front of the ship and leaned toward the door. At this point, he said he jumped and when the parachute opened he could hear the noise of the ship as it decended and as it crashed. In about fifteen or twenty seconds he was on the ground. He called to Rossiter just after the ship crashed, thinking that he might possibly be near him in the air.

When the plane landed Rossiter was on the outside of it, and the door was open, indicating that he had jumped or was about to do so. At that time the plane must have been close to the ground. Widmer must have evidently thought that Rossiter did jump. Someone in an automobile passing where Widmer was near the road, took him very shortly afterwards to an automobile service station and he called up our manager in Los Angeles. At that time Widmer was so confident Rossiter had jumped that he told the manager that both of them had left the plane by parachute. So sure were they of this that the manager's wife in Los Angeles called me up here in San Francisco at my hotel immediately, giving me the information that they had left the plane by parachutes. The men were evidently very close to the ground when Widmer gave Rossiter the last signal to jump, because his parachute landed him on the ground in about fifteen or twenty seconds after he left the ship.

Widmer and Rossiter were friends and Widmer thinks that the reason Rossiter did not jump earlier was because each one of them wished to stay with the ship as long as the other one did and was waiting for the other one to jump. As far as I know, I have heard of but one criticism of Mr. Widmer, and that was by someone at Bakersfield and I was told that he afterwards wrote to our airport in Los Angeles asking for the facts in the case. Because of this criticism the Post Office Department at Washington temporarily suspended Mr. Widmer and made an investigation here of the accident. Immediately upon receipt at Washington of the report of this investigation, the Department telegraphed us reinstating Mr. Widmer.

Pacific Air Transport
C. N. Comstock,
Vice President.

The Waterbury Lightplane Club

In the Nov. 22 issue of AVIATION, *an announcement was made and some details published on the formation of the Waterbury Light Plane Club of Waterbury, Conn. As this news has doubtless been read with considerable interest, the following letter, from the president and founder of the Club, is of particular interest.*—EDITOR.

To the Editor of AVIATION:

It may interest you to know that a lightplane club has been formed here in Waterbury.

Below is an extract from the Constitution:

> Art. 1., Sec. 1: This club shall be known as "The Waterbury Light Plane Club," having for its purpose the promoting of interest in aviation, particularly as it applies to lightplanes; to promulgate the knowledge of aeronautics by securing speakers, literature, and instructors for the teaching of aerodynamics; to aid in the advancement of aviation by lending its support to all branches of aeronautic activity; to foster new developments in aeronautics; to give its members practical experience in maintaining and flying of aeroplanes, and to engage in lightplane activity by designing, building, and operating light planes.

So far as we know this is the only club of its kind in America.

The following will give a brief history and events leading up to the forming of the club. The writer's attention was first called to lightplane activity by the publicity given Dormoy's "Flying Bathtub," and thought it would be fun to design and build a plane powered with a motorcycle engine. Not knowing the first thing about the game or where to get any information I got all the books available at the Public Library and started in on the study of aeronautics, and immediately ran into this difficulty. The books were either too elementary, or too technical, and contained nothing but theory with no practical information. After having mastered this theory fairly well, which, by the way, was theory of 1908 to 1913, I found that I was at a loss to know how to apply it. The first real practical information I came across was in the articles on Stability by B. V. Korvin-Kroukovsky appearing in AVIATION. At last I had something I could use. The next practical information was contained in the N.A.C.A. Reports Nos. 311 and 326., The Light Airplane by Ivan H. Driggs, and, right here, I want to express my appreciation of the help Mr. Driggs gave me. Some parts of the report were not clear to me, and I wrote him long letters asking for information, and he wrote back with letters just as long giving that information.

In reading AVIATION, I became interested in articles on lightplane clubs and it must have been then that the thought was born that a lightplane club in Waterbury would be a fine thing. Nothing was done at that time as I did not know anyone else interested in the same subject. This past Summer, I became acquainted with R. S. Kelsey, who is a student of M.I.T. and interested in aeronautics. Mr. Kelsey has been a pilot since fourteen years of age and we spent a very profitable Summer comparing notes. As time went on I felt the need of learning to fly, realizing that it would help in designing an airplane, but the cost of flying in this locality was more than I cared to pay for a hobby. Mr. Kelsey knew of a plane belonging to the Colonial Air Transport Co. which had not been used by them all Summer and suggested I try and rent it, he teaching me to fly. We found the plane was for sale and not for rent. Not being in the market for a plane personally, that called everything off.

Soon after that, however, it occurred to us that others might welcome an opportunity to learn to fly and if we would get four or five fellows who would be willing to go in on the plane, the cost to each one would not be prohibitive. The idea was a good one, at least we thought it was, but it was no easy matter to convince others.

Finally, after much effort and many disappointments, we got two other fellows besides ourselves, making four in all, who were willing to buy the plane. In the meantime, we had been thinking of the club idea and a lot of the fellows we had talked to thought it would be a good thing. So why not form a club, the four men buying the plane being the charter members, turning the plane into the club to be used by its members at a rate to cover the cost plus something for a sinking fund, or a cracking fund, whichever you want to call it.

So the club was formed and held its first meeting Aug. 31, 1926, the four charter members being R. S. Kelsey, B. I. Jones, R. W. Barker, and O. D. Crooker.

The Club has two grades of membership,—Full grade and Social grade. The privileges for each grade are laid down in the Constitution being just what the names imply. The initiation fee for full grade membership is $100.00, the four charter members paying their fee of $100.00 each into the Club's treasury. It was voted at the first meeting that the Club accept a loan from the charter members of sufficient amount to pay for the plane.

The plane was purchased Sept. 1, and put into operation Sept. 2 and flew 29 hr. and 27 min. from that date to Sept. 26, being in the air every day with the expection of two when it was raining. Mr. Kelsey was the instructor. The three other charter members are ready to solo and some of the other members have received instruction. The fact that we had the plane to build the Club around has helped and quite a bit of interest has been shown.

The Club held its eighth meeting Oct. 19, and has seven Full members, and five Social members to date. We have a class in aerodynamics every meeting night and expect, by next Winter, to have a lot of lightplane designers. We have one design nearly complete now and hope to be able to build the plane this Winter.

It is our hope other Clubs will be formed in this country and that they will design and build lightplanes in which event we will be able to hold meets similar to the ones held in England.

O. D. CROOKER, *President*

Another Flying Club

To the Editor of AVIATION:

I was much interested in your Nov. 22 issue to read about the Waterbury Lightplane Club.

They were not the first, however, to do this in this country as that is the way our Santa Barbara Aero Club was started three years ago.

We all put in $50. each and purchased a Jenny. In the Club were three licensed pilots. Only these pilots were to fly the ship until they could teach some of the others.

A lawyer friend advised us not to hold the ship in the name of the Club because of the liability against the members in case of a damage suit. So we chose one member whose material wealth did not overburden him, made the ship over to him, with the understanding that he (a pilot) would instruct those who were not pilots to the extent of $50. on the basis of ten cents per minute. The pilots could take their $50. out of the ship at the rate of seven cents per minute, actual flying time. The owner of the ship paid for gas and oil, but the pilot at the time assumed any damage in a crash.

The scheme worked out very well. Everyone who put in his $50. got his money's worth out of the ship, an enthusiastic club was started, and the fellow who did a lot of the work was rewarded by being able to get a ship with the expenditure of a comparatively small amount of money.

I put these facts forward to readers of AVIATION as it may be that other communities can do likewise. It's a good way to start a club off as a going, *flying* club, and not merely a lot of Modocks who indulge in aviation conversation only.

Earle Ovington,
Senior Staff-Commodore.

Dr. Prandtl to Give Wilbur Wright Lecture

The Royal Aeronautical Society, England, announces that the Wilbur Wright Memorial Lecture will be delivered next May by Dr. Prandtl, of Gottingen University, Germany. Professor Prandtl will deliver his lecture in English.

Side Slips

By ROBERT R. OSBORN

The Intrepid Aviator came in the office the other day, indignantly waving a newspaper clipping and demanding that something be done about it. We gathered from the clipping and his excited talk that someone left a "Jenny" in a back yard in Kentucky somewhere and never came back. That a "Jenny" should be deserted in such fashion, after giving the best years of her life in faithful service, pained our friend deeply, and he wants to establish a "Home for Aged and Infirm Jennies." We suspect that his motive is not purely philanthropic, however, as he wants someone else to endow the Home, and has a plane of his own which might be the first inmate.

* * * *

From the Punta Gorda, Fla., Herald: "The continuous popularity of flying in Punta Gorda is reported to have inflicted something like 200 local citizens with complications of flyfoid fever, aerosipelas, inflewenza and skyatica."

We don't think there is any cause for worry over these complications. If the patients will carefully maintain a diet of half-rolls and pancakes and use some simple home remedies such as fliodine and flysol there shouldn't be any trouble at all.

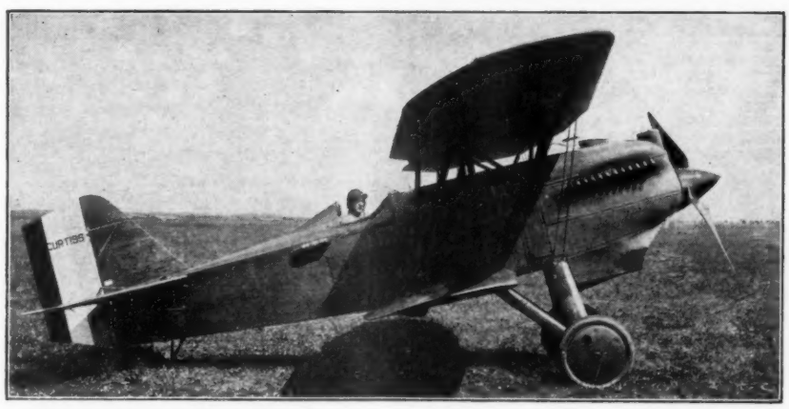
* * * *

Speaking of the "general use of aircraft," there is one of the general uses we can't quite understand. Whenever a prominent person disappears, or some sort of murder or robbery is committed and the criminals make a getaway, the first thing that seems to come to mind is to dash around to get an airplane to join the search. Whenever such a search is going on, the newspapers always feature the fact that "Airplane Is Placed On Trail," or "Three Airplanes Are Hunting Mail Robbers." We hate to risk taking away any lucrative business from the gentlemen attempting to make a living from commercial aviation, but we must have our curiosity satisfied. Has anyone ever been found while being looked for in this way? In flying over strange territory, the conservative pilot is going to stay at an altitude high enough to keep a good field within gliding distance, in which case, how does he tell that those two lumps he sees on the landscape are Gyp the Blood and Izzy the Thug and not just a couple of other fellows? Sometimes, when even cities and towns can't be recognized, what chance has a flier of recognizing a missing person he has probably never seen?

We suppose that if this form of search for thugs and missing persons is going to remain as popular as it seems to be at the present time, it will come under the jurisdiction of the newly-established aerial police departments. Will they broadcast circulars and bills advertising "$1,000 Reward for Arrest and Conviction of Smith, Forger and Fugitive From Justice. Photograph taken from 1500 ft. shows Smith standing in field of cabbages wearing grey checked suit. Smith is the one fifteen from the right in the fourth row.

* * * *

The Intrepid Aviator was in again the other day, making inquiry about train fare to the Pacific coast, and freight rates for sending his airplane to the same locality. It seems that he has been reading in the advertisements advocating the eating of yeast, about some flier there who was so busy night and day that he had to gulp down all of his meals, thereby contracting indigestion. Our friend says that the way his business has been this Winter, he could take three hours to each meal without noticing it. He says he is willing to risk the most violent forms of indigestion, and will eat as many as ten yeast cakes a day, if he can be that busy.

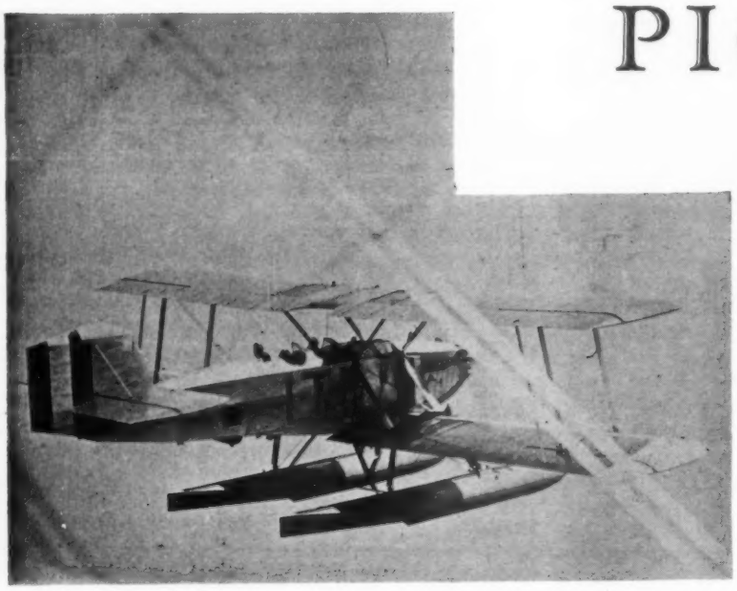


THE CURTISS HAWK ARMY PURSUIT PLANE
Powered with Curtiss D12 450 h.p. Engine
Equipped with

SCINTILLA
Aircraft Magnetos

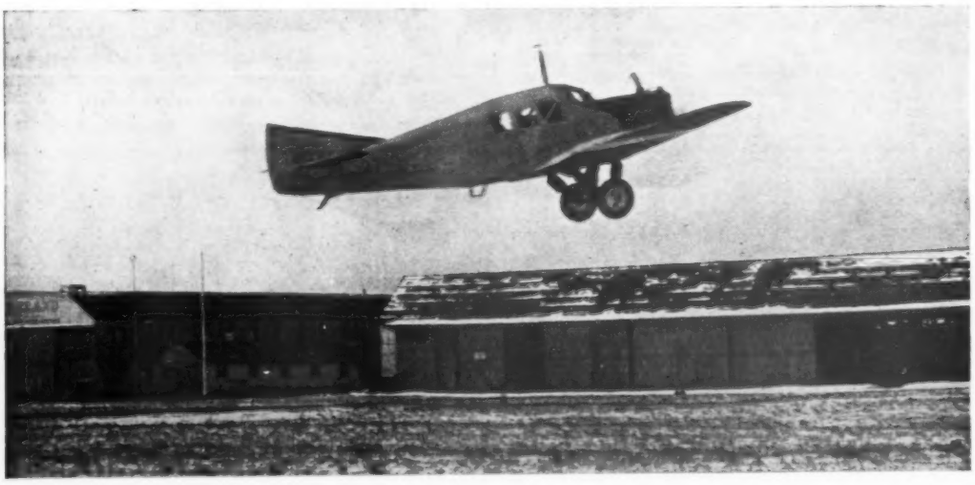
SCINTILLA MAGNETO COMPANY, INC.
Contractors to the U. S. Army and Navy. SIDNEY, NEW YORK

PICTURES I



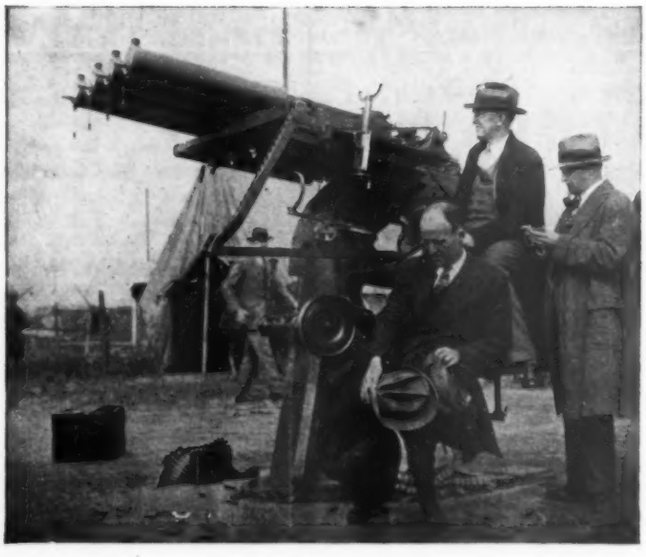
THREE JOBS IN ONE. A Navy CS three-purpose plane carrying out torpedo practise at sea.

(Above) SPEED. Harry A. Miller's "Los Angeles" being paced by a Curtiss MF seaplane in the opening heats for the famous Elgin Trophy off San Diego.

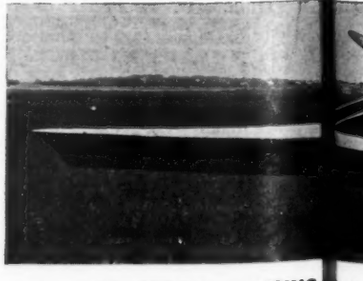


(Above) MEMORIAL DAY. The Junkers monoplane leaving Curtiss Field for Kitty Hawk, N. C. carrying the wreath which Dr. Hugo Junkers sent from Germany to commemorate Dec. 17, 1903, the day of the Wright Brothers' first flight. The plane carried Miss Herta Junkers, daughter of the famous German airplane constructor.

AIRSHIP TRAINING. The Navy train



(Left) Fred. Melchiol, J. Otto Scherer, John Goldstrom



LOW-POWERED FLYING. now

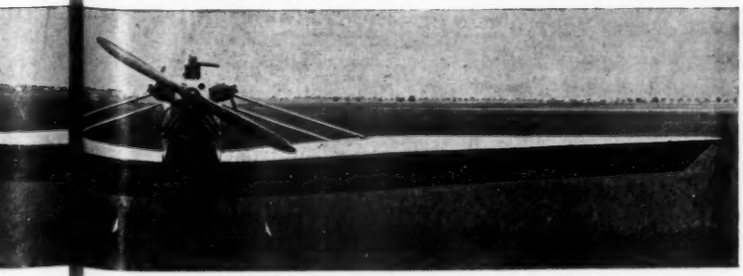
THE NEWS

ALL METAL. One of the most interesting planes in the Paris Aero Show is the Avimeta AVM 88, a two-seater fighter with 595 hp. Hispano-Suiza engine. The machine is built entirely of the Schneider light alloy "Alferium" and has an excellent performance. As will be seen, the propeller is a Reed metal twisted type.

A MAN CARRIER. The new Argabrite man carrying kite, said to be capable of lifting 186 lb., undergoing tests at Los Angeles.

(Below)
THREE JOLLY FELLOWS. The three assistant secretaries for air, F. Trubee Davison (War), William P. MacCracken, Jr. (Commerce), and Edward P. Warner (Navy).

training airship leaving Lakehurst, N. J. She is equipped with twin Wright engines.



echoslovakin Avia BH-11 (Walter, 60 hp.) two-seater lightplane which is popular low priced touring machine in Europe.

FOREIGN AERONAUTICAL NEWS NOTES

By Special Arrangement with the Automotive and Transportation Divisions, Bureau of Foreign and Domestic Commerce

French Air Administration

A Government decree announced recently at Paris, established the directing personnel of French aeronautics. Offices named in the decree include a General Director of the Central Administration for Aeronautics and Aerial Transport, Director of Aeronautical Construction, Director of Aerial Routes and Communications, and Chief of Personnel and Accounting.

This arrangement of the French Aeronautical Administration ends the uncertain situation which has existed since the abolition of the office of the Under-Secretary of State for Aeronautics, last August.

Reorganization of the personnel of the various aeronautical services, in line with the general economy policy of the Government, will permit, it is reported, the elimination of about 70 employees, and an annual economy of about 600,000 francs.

Rome-Berlin Air Line to Open in Spring

An agreement was concluded recently between the Deutsche Luft Hansa and the Aero-Lloyd for the joint operation of an air line between Berlin and Rome. Negotiations have been in progress for nearly a year, but they were hampered by the fact that arrangements with various Italian companies had to be made separately. The amalgamation of the Italian interests in a single enterprise enabled negotiations to be brought to a conclusion.

The technical difficulties are, of course, great, particularly in the Munich-Milan section of the route, in which the problem of crossing the Alps has to be met. It is hoped, however, that it will be possible to open the new airway next March or April. The agreement is similar to those already existing between the Luft Hansa and other foreign air companies for the joint operation of services.

Japan Contracts for Passenger Air Liners

A British firm of aircraft manufacturers has closed a contract with Japanese interests for twenty-five passenger air liners. The planes will be of British manufacture entirely and will cost $50,000. each. They will be equipped with two engines of 1,000 hp. The planes will seat between fifteen and twenty passengers and will operate on an air line to be opened in Japan next year.

New Swedish Air Line Planned

A conference was recently held in Gothenburg, Sweden, between government officials, representatives of the "Association For Air Traffic", in Gothenburg, and Aktb. Aerotransport, during which plans for air traffic to and from Gothenburg during the coming season were discussed.

It is believed in Sweden to be probable that the Gothenburg-Oslo line will be established, but it is believed doubtful whether the projected line Stockholm-Gothenburg, which would enable travelers to complete the journey from Helsingfors to Hamburg in one day, will be realized. Present means would probably not be sufficient for a government subsidy, it is said.

The Royal Swedish Board of Trade has approved of Aktb. Aerotransport's application for a subsidy of 550,000 crowns during the budget year 1927-28 for commercial aviation, for 560,000 crowns for increase of the Commercial Aviation Loan Fund and for 11,653 crowns to be spent on the radio stations at the aerial ports of Stockholm and Malmo.

A Possible European Airway Center

Efforts are being made in Czechoslovakia to develop the capital city, Prague, into a junction point for inter-central European air-lines. Negotiations are reported already to have been concluded with Great Britain relative, in principle, to the proposed London-India line via Czechoslovakia but the consent of Germany, whose territory would be crossed by the proposed line, has not yet been obtained, it is said.

It is hoped locally, however, that the Cologne-Prague section of this line can be put into operation in the Spring of 1927. Negotiations are at present in progress with Germany relative to a line Berlin-Prague-Vienna. In return for permitting the use of Prague as a pivotal center, Czechoslovakia is said to be insisting upon the right to establish a line from Prague to Hamburg.

Preliminary negotiations with Yugoslavia concerning the Prague Bratislava (Pressburg)-Sagreb (Agram)-Trieste line are well advanced. Further negotiations with Italy and Hungary are pending. Existing treaties between Czechoslovakia and Poland provide for a line to cross central Czechoslovakia, Warsaw-Brunn-Vienna, and in return accords Czechoslovakia the privilege of establishing a line Prague-Ofacow or Prague-Kattowitz with extensions via Lembert to Soviet Russia. Preparations are under way for establishing modern landing fields at Prague, Brunn and Bratislava (Pressburg). The civil airport at Prague already possesses six hangars. The erection of a lighthouse and other improvements are planned for 1927 when it is also intended to open a school for pilots under government auspices.

Prague Aviation Exhibition

The Fourth International Exhibition of Aviation will be held at Prague, Czechoslovakia, from June 4 to 16, 1926. The Aero Club of Czechoslovakia is in charge of the exhibition, which is under the patronage of the president of the Republic, T. G. Masaryk.

The previous exhibitions attracted exhibitors from all the greater European countries and America and were very successful. Even greater interest is expected in the coming exhibition, in which American interest will be asked to participate.

Landing Fields for Bolivia, S. America

New airplane landing fields are to be built in Bolivia at Mizque, San Isidro, El Paso Pampa Grande, and Taruma, according to reports. The Lloyd Aero Boliviano hopes, within a comparatively short time, to have a passenger service that will connect even the remotest districts of Bolivia. The Government will pay the Lloyd Aero Boliviano a subsidy of Bs. 25,000.

Another Brazilian Airline Projected

Senor O. E. Meyer, who intends to organize an air service in Rio Grande do Sul, has sailed for Germany where he will purchase material necessary for this service. He will return in May, 1927 with two airplanes of 460 hp. and capable of carrying ten passengers, in addition to the pilot. The lines to be operated are: Porto Alegre to Pelotas and Rio Grande; Porto Alegre to Santa Maria; Porto Alegre to Praia de Banhis and cities along the coast. The following rates will be charged for passages: From Porto Alegre to Pelotas, 110$000; to Santa Maria, 125$000; to Quintao, 50$000; to Cidreira, 70$000; to Tramandahy, 80$000; to Torres, 120$000.

Consolidated Airplanes Wear Well

Quality is first in their design and manufacture
Up-keep, ordinarily a serious problem is almost nil

Trade Mark *Copyrighted*

Only American manufacturers specializing in training airplanes
Five years continuous development on one basic design
Safest training and sportsmen's airplanes ever flown

Contractors to United States Army and Navy

CONSOLIDATED AIRCRAFT CORPORATION
Buffalo, New York

AIRPORTS AND AIRWAYS

Chicago, Ill.

By Otto Klein

The Chicago Municipal Airport, which has undergone steady improvement during the past few months, is quickly becoming a first class field. The beacon and runway lights have been in operation for the past two months. The National Air Transport, Inc. is building a 120 by 80 ft. hangar at the field, and, according to the Sievert Aircraft Corp., which is in charge of the field, there are now six carloads of cinders being put in daily in order to extend the present runways and build new ones. There is considerable flying going on at the Chicago Airport, and the Sievert Aircraft Corp., which represents the Eaglerock and Fokker in this city, keeps its planes in the air right along.

The Ostergaard Aircraft Works is enjoying a good business in aircraft parts and supplies. They are at this time of the year making a specialty of high speed aerial driven sleds, and are selling complete sleds as well as propellers and accessories for same. They are at present building a Catamaran, powered with a Diesel engine.

The Wallace Aero Company, according to Stanley Wallace, is inaugurating an aviation school, teaching mostly motor mechanics and aircraft construction, but also actual flying if desired. Stanley Wallace has for many years been actively engaged in aircraft designing and construction and has the knowledge and facilities necessary to conduct a first class ground school. The Wallace Aero Company will in the near future, begin the construction of a three-place OX-5 job, having a steel tube fuselage and duralumin wings, exact details of which have not yet been made public.

E. B. Heath, president of the Heath Airplane Company, is still sojourning in the South, and last reports have it that, in company with P. G. Boren of San Antonio, he flivvered into the wilds of Texas to hunt rattle snakes and Mexican rebels.

It has been decided that the new organization that was formed recently be hereafter known as the Aircraft Operators Association, this name being not quite as general as just plain Aircraft Association, as first suggested. It is the aim of the new organization to include everyone actively interested in aviation, whether pilot, mechanic, photographer or any other trade or professional directly connected with the aviation industry, in and around Chicago. The association already boasts of a good membership list, and it is hoped that eventually all those eligible will join so that Chicago will at last have an organization that is not only representative of the aircraft industry in and around Chicago, but also one that brings about that hundred per cent co-operation so long needed among the fliers here.

Dothan, Ala.

M. H. Edwards, of Dothan, Ala., has donated a site on Cottonwood Road for an aviation field. Mr. Edwards is giving this to the town for a period of two years.

TRAVEL AIR

FOR AIR TRAVEL

"……thanks…for…
the splendid job you turned out"

Says Carl V. Schlaet, of Tampico, Mex.

Last June, Mr. Schlaet, who is associated with the Compagnie Aviacon de Nationale, at Tampico, came to our factory and bought a Travel Air, a regular OX-5 job, after making many comparisons with other makes. Before going to Tampico, he flew his ship to Kansas City, on June 16th, and after a flight which was a real test, Mr. Schlaet wrote the letter just opposite, on the same evening.

Dear Beech:

"I'm plenty tired, but must write you a line of congratulations on your ship. Dodged two storms, went thru a third,—where the air was so rough it bounced my bag (belt and all) off the front seat onto the floor,—and landed at Richards Field at 7:30. Exactly two hours. Never could have made it with a Standard. The wind was so bad it took a Jenny which was staked down on Richards field over a hedge—stakes and all. Richards Field was a lake, but she showed no tendency to nose over.

"My regards and thanks to you, Mr. Cessna, Clark and Dale, for your conscientious work and the splendid job you turned out."

Sincerely,
(Signed) Carl V. Schlaet."

Let your plane be one of the several Travel Air Models.
May we send catalog?

TRAVEL AIR MFG. CO., INC.
WICHITA, KANSAS

Max Fortner is laying out the field, which will measure 2,000 x 7,000 ft., and will have adequate runways for taking off and landing. A sign will be painted on the top of a nearby building pointing to the field and necessary markers for visiting pilots will also be installed.

A gasoline and oil station will be established on the field.

Richmond Airways, Inc.

By W. H. Wincapaw

Richmond Airways, Inc., of Greenridge, S. I., N. Y., had a good season, considering the weather on week-ends, when most of the passenger-carrying occurs. The company carried approximately 2,167 passengers during the year and instructed several flying students. The flying was done in two converted HS2L, seven-place, flying boats, and one converted four-place boat. These boats were all converted under the supervision of the company designer, George Schaaf, who has had an experience of sixteen years in designing and building planes.

At present six new monoplane flying boats are under construction from designs made by Mr. Schaaf. They will be powered with 200 hp. air-cooled engines. The bed on these is so designed that either a C-6, K-6, Hisso or Wright Whirlwind will fit. These seaplanes will carry four passengers besides the pilot.

The changing of an HS2L flying boat into a six-place plane, for J. A. Haynes, of Miami, Fla., has just been completed. The plane will be flown to Florida by either the owner or W. H. Wincapaw, chief pilot for the company. Mr. Schaaf, who had charge of the work, will accompany the plane South.

Jacksonville, Fla.

Plans are being made for the opening of the recently completed $55,000 municipal airport at Jacksonville. The dedication will take place during the holidays. Thomas C. Imeson, chairman of the city aviation committee, and postmaster H. E. Ross, are in charge.

The Price-U-Drive-It Co., of Jacksonville, now has two Travel Air OXX6's and two Waco planes in taxi service from the Jacksonville airport. A. B. McMullen Co. is operating several planes from the Tampa airport, offering instruction to novice pilots.

Hialeah, Fla.

By Don. C. McIntosh

The East Coast Aviation Camp, the latest addition to Florida's aeronautical activities, began operations recently at the Municipal Field, Hialeah, Fla. Two Waco 9 planes are in use at the present time, and the camp expects to purchase another Waco 9 in the near future, as business is increasing rapidly.

The personnel of the organization includes Billie Randall, Manager and "Les" Lewis pilot in charge with L. Needham as chief mechanic. Pilot "Les" Lewis began his flying career several years ago, learning to fly at the Curtiss Florida Aviation Camp. Since then, he has done a great deal of cross-country flying and instruction, and he has also done photographic work, advertising and sightseeing flights. He has an enviable reputation for sane, conservative flying, and is a favorite with passengers. He allows none of his planes to be stunted.

The camp has an excellent mechanic in the person of Mr. Needham, who has had extensive experience in Army and commercial aviation.

A complete flying service is offered, including sightseeing flights, instruction, photography, aerial advertising and cross-country flights to any point.

Visiting pilots are always welcome at the field, where gasoline, oil and other supplies may be purchased.

Rodgers Field, Pittsburg, Pa.

By Ray A. Tucker

At the instigation of the Aero Club of Pittsburgh, a Municipal Air Board for the administration of Rodgers Field, the City-County Airport at Aspinwall has recently been organized,

At Your Service

Aero Supply Mfg. Co., Inc.

Manufacturers and Distributors of

Airplane Accessories and Supplies

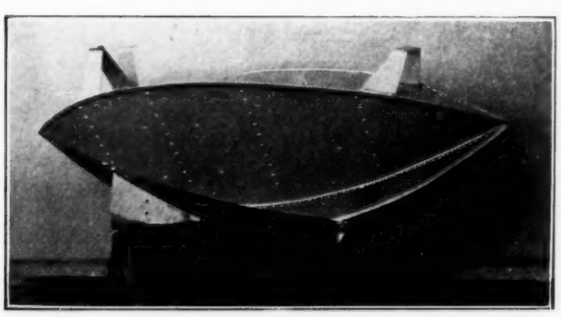
Call on us for anything. We will help you.

College Point, Long Island, New York.

FLYING EDO BOATS

Manufacturers of

DURALUMIN FLYING BOATS, PONTOONS, WING FLOATS and SKIIS



DURALUMIN FLOATS FOR MF's OR SEAGULLS. WEIGHT 11 LBS. EACH READY TO ATTACH. A FEW SETS FOR SALE AT $85.00.

EDO AIRCRAFT CORPORATION

COLLEGE POINT, L. I., N. Y.

and is composed of three members, one representing the County of Allegheny, one the City of Pittsburgh, and the third the Aero Club of Pittsburgh. William C. Jacobs, Assistant County Solicitor was appointed by the Commissioners to represent the County, William J. Snyder was appointed by Mayor Kline to represent the City, and Louis T. Barry, vice-president of the Aero Club, was appointed to represent the Club by Raymond M. Marlier, president. All of these gentlemen were fliers in the Army Air Service during the War, and are thoroughly qualified to carry out the administration of Rodgers Field, as authorized under a City Ordinance presented by Mobert Garland, on Sept. 13, 1926.

The City-County Air Board will control Rodgers Field for the benefit of the citizens of the City of Pittsburg and County of Allegheny and of fliers arriving from other cities. The City-County Air Board will establish rules and regulations governing flying in and over the City of Pittsburgh and the County of Allegheny, rules and charges, for the use of Rodgers Field and for the sale of supplies and materials which may be furnished there, and to control the admission to Rodgers Field in order to protect the public and the users from accident and injury.

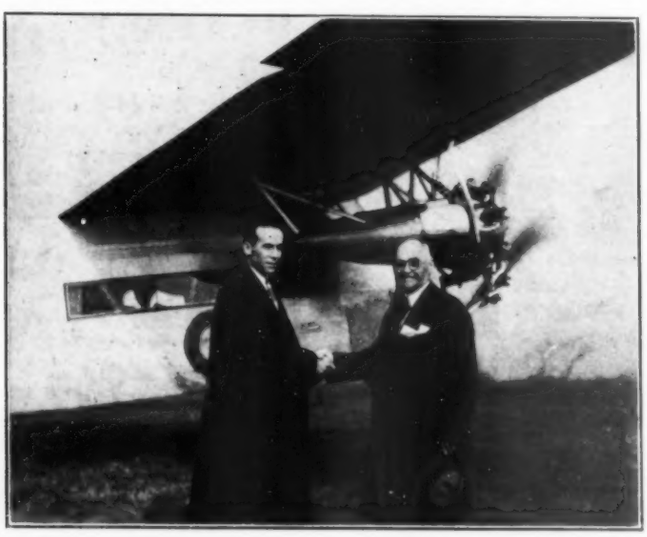
The members of the Board serve without pay and each member is appointed for a term of two years.

Bettis Field

By Dean Ivan Lamb

Bettis Field, named in honor of the late Lieut. Cyrus K. Bettis, winner of the Pulitzer Trophy in 1925, who lost his life while flying over the Pennsylvania mountains last Summer, is now open to the flying public.

This is the largest field in a radius of fifty miles of Pittsburgh and is in splendid condition at all seasons. At present the field has two level runways over 300 ft. wide and of the following lengths: N.W.-S.E. 1600 ft. long; E. & W. 2400 ft. long. These runways are being gradually widened and the following additional runways will be in operation by April: N.W. & S.E. 3700 ft.; N.E. & S.W. 2700 ft.; N. & S. 2700 ft., thus making the field suitable for all types of planes. Night flying equipment will be installed during 1927.



D. Barr Pear, who has been largely responsible for the establishing of Bettis Field, greeting Col. Henry C. Fry, Chairman of the Aviation Board, Pittsburgh Chamber of Commerce.

Work on the large steel hangar with all modern improvements is now being rushed. The installation of an electrically driven gasoline pump from a large storage tank is nearing completion. This will insure the servicing of planes in the shortest possible time.

This field is the terminal of C.A.M. No. 11 between Pittsburgh, Youngstown and Cleveland, which is to start operations on Feb. 1.

WINTER has CAME!

A Message of Good Cheer to wouldbe F'LyERS

you can bet that motheaten Jenny youve been pushing around all sumer that there isnt a face around the Alexander hangar that looks like which I have drew.

the $50 dollers for 5 hrs offer to the youngsters who are just newley airminded has brot a good bunch away from the kitchen stove and into high dry and sunny Denver

Chief Pilot Verner soloed one bimbo in 4 and 1/2 hrs and he didnt know the joystick from the prop wen he hit Alexander Airport.

Sez he - the $10 dollers per hr for extra time listened like a 40 peace band and hes laying away sum of that to put the polish on.

expect hell slap down his hundred smackers for Spring delivery and the free $50 dual control or maybe take a quick flyaway with one on time payments now hes thru training.

it aint such a hellava life at that wen a square shooting bunch make it easy to fly your own

yours
Jack Flipper, Mech

P.S. + N.a.a. These dealers pasted below have demonstrator Eaglerocks and give a swell course of instruction at reasonabel rates. J.

Southern California—Aero Corporation of California, Los Angeles
Northern California—W. L. Lamkin, Porterville, California
Michigan—Niles Airways, Niles, Michigan
Indiana—Captain J. A. Yonge, Gary, Indiana
Illinois—Sievert Aircraft Corp., Chicago
Okla. & Tex. Panhandle—Southwest Airplane Sales Corp., Okla. City
Virginia and North Carolina—J. S. Charles, Richmond, Virginia.
W. Mo. and E. Kan.—Bennett Eaglerock Sales Co., Kans. City, Mo.
E. Mo. and Arkansas—Bridgeton Aircraft Corp., St. Louis, Mo.
N. Y. and Conn.—G. Torlotting, Curtis Field, N. Y.
Western Kansas—C. E. Steele, Dodge City, Kansas
Wyo. and Montana—Wyoming Airways Inc., Casper, Wyo.
N. Y. and Conn.—G. Torlotting, Curtis Field, L. I., N. Y.
Southern Texas—Jack Hair, Box 420, San Antonio, Tex.

ALEXANDER AIRCRAFT CO.

ASSOCIATED WITH ALEXANDER INDUSTRIES
ROOM 401, ALEXANDER INDUSTRIES BLDG. DENVER

A one hundred foot circle of rolled white slag marks the center of the field, which is entirely clear of obstructions, the wires at the Southeast corner of the field having recently been placed underground and the few trees above the level of the field cut down.

Military pilots have found this the safest and most convenient field in the Pittsburgh district and in the Air Service it is known as "The oasis of the mountains" (even though the field itself has excellent drainage). Aside from being the largest field in the Pittsburgh district, it is usually clear of the smoke pall and above the river fogs. The field lies on a plateau in an air line from the junction of the Monongahela and Allegheny Rivers (forming the Ohio) and the junction of the Monongahela and Yohoghany Rivers, seven miles Southeast of former and one mile Northwest of the latter, making it easy to find from the air. Prevailing winds are from the West. Pittsburgh and nearby towns with a total population of more than two million people is within thirty minutes drive of the field over first class roads.

The Lovejoy Flying School is operating on the field the year round and aside from the very large class of students, conducts an air taxi business to any part of the country with all new and modern equipment.

The field is owned and operated by Harry Neel, under the management of D. Barr Peat.

Springfield, Mass.

By Serg. Harry J. Jenkins

Lieut. J. C. Dawson, of the Air Corps Reserve, Worcester, Mass., and Miss Mae Fanton, of Brockton, Mass., were married while flying in an airplane at Fort Crockett, Tex., where Lieutenant Dawson is on duty. Other officers from the field witnessed the ceremony in planes which flew close to the bridal party.

The Springfield Chamber of Commerce is planning the establishment of a flying field shortly. A new air mail route, with Springfield as a stopping place, is a possibility of the near future and an effort is now being made to stimulate interest in the flying field project.

Lieut. Winthrop O. Sargent, Army Reserve pilot, is flying his Hisso-Standard from a field between Holyoke, and Northampton, Mass. He is carrying passengers every week-end and is planning to erect a two-plane hangar at this field later.

Lieut. P. H. Spencer, of Hartford, Conn., is seen in Springfield with his Waco 9 often. Local photographers who wish to take pictures from the air have used Lieutenant Spencer's plane a great deal recently.

UNITED STATES AIR FORCES

Canal Zone Photographed from Plane

The 12th Photographic Section, Air Corps, stationed at France Field, Panama Canal Zone, has recently accomplished the feat of photographing the entire Panama Canal Zone in one picture. The photograph was taken at an altitude of 12,000 feet and covered a distance of about 60 miles, including the fortified islands of the Pacific side, Fort Sherman on the Atlantic side and portions of both Atlantic and Pacific Oceans.

Record Made in Changing Engines in Martin Bomber

A remarkable record in changing two engines of a Martin Bomber was recently made by four mechanics of the 23rd Bombardment Squadron, at Luke Field. Plane No. 69, of the 23rd Squadron, landed at about 11:30 a.m., and was placed out of commission by the engineering officer. The crew chief was instructed to install two new engines. As Wednesday afternoon is generally devoted to athletics, the engineering officer was greatly surprised to find the airplane on the line ready to go the next morning.

Inquiry revealed that the crew chief, Sergeant McAdams, had overheard the operations officer regret the loss of the plane for the next day's mission, had then assembled the crew, consisting of Sergeant Eckert and Privates Wagner and

PITCAIRN
PLANES

The Pitcairn Orowing
$2000.00
at Factory

A three place commercial plane that has established its desirability in extensive passenger service, sport use and instruction work.

Powered with OX-5 motor. Equipped for dual control.

Excellent performance with remarkable inherent stability and ease of control.

Construction incorporates numerous refinements designed for simplicity, strength and inter-changeability of parts.

The price—$2,000—is made possible by the Pitcairn organization craftsmanship and the application of modern production methods.

Complete description on request.

Inquiries invited looking to dealer representation

PITCAIRN AIRCRAFT·INC
LAND TITLE BUILDING PHILADELPHIA

Adams, and started work. At seven o'clock that night both engines had been removed, new ones installed and tested, and the plane was ready.

It is believed that the changing of these engines in approximately six hours is very close to record time for this work.

Extensive Airway Flying Carried Out During Year

During the past fiscal year Army airplanes made approximately one thousand cross-country flights on the Eastern Division of the Model Airways from Washington to Dayton. Commercial pilots also took advantage of such travel over an organized and identified route.

The volume of traffic over the Model Airways is indicated by the accompanying table prepared in the office of the Chief of Air Corps, classifying planes in service during the past fiscal year at Langin Field, Moundsville, West Virginia, on Army Airways intermediate station on the Washington-Dayton Division:

Month	Army	Navy	Marine	Passed Over: Commercial	Passed Over: Did Not Stop	TOTAL
July	93	0	1	6	15	115
August	88	0	2	7	15	112
September	102	3	3	8	20	136
October	186	0	1	14	30	231
November	62	0	0	3	10	75
December	49	1	2	4	10	66
January	54	1	0	1	10	66
February	41	0	1	2	5	49
March	68	0	0	0	10	78
April	62	3	1	3	10	79
May	92	4	0	15	15	126
June	62	2	3	3	10	80
	959	14	14	66	160	1213

Mechanics School, Selfridge Field

A post school, offering courses in academic subjects, motor mechanics, airplane rigging, wood working and auto mechanics was inaugurated at Selfridge Field on Oct. 29, and a large enrollment was reported from each of the squadrons. The school of instruction in personnel work also began at the same time.

Helium Gas Purification Unit A Success

Major Gen. Mason M. Patrick, Chief of Air Corps, announces that a helium gas purification unit, mounted on a railroad car, has been completed and tested at Scott Field, Belleville, Ill., the instruction center for lighter-than-air activities. It is estimated that this unit will purify helium at a cost of $1.50 per thousand cu. ft. Formerly it was necessary to ship impure helium to Lakehurst, N. J., for purification. Not only did this involve a considerable freight charge, amounting to $12.26 per thousand cu. ft. from Scott Field, but there occurred a loss of from five to fifteen per cent of the volume of the gas on each transfer between receptacles. Therefore the use of the new purification unit at Scott Field is expected to effect considerable cost reduction.

Officers Detailed to Air Corps

Nine officers, of other branches of the service, were recently detailed to the Air Corps. With the exception of Sec. Lieut. Leslie Page Holcomb, Field Art., they were ordered to proceed to Brooks Field, Tex., for primary flying training. The officers affected are: Capt. James M. Adamson, jr.; First Lieut. Donald H. Nelson, Cavalry; Capt. Russell C. Snyder, First Lieut. Roy P. Huff, Field Art.; First Lieuts. Arthus L. Moore, John F. Pahilke, Sec. Lieuts. Robert C. Andrews and Ray B. Floyd, Inf.

Air Corps Promotions

Special orders of the War Department, recently issued, announced the following promotions of officers of the Army Air Corps: First Lieut. Russell L. Meredith to Captain, with rank from Sept. 10, 1926; Sec. Lieut. Donald Boyer Phillips to First Lieut., with rank from Oct. 16, 1926; Sec. Lieut. Cecil Elmore Archer to First Lieut., with rank from Oct. 29, 1926; Sec. Lieut. Paul Hanes Kemmer to First Lieut., with rank from Sept. 25, 1926.

PRIVATE OPERATORS made the discovery that airplanes engineered to meet the exacting requirements of the **POST OFFICE DEP'T.** were more economical to keep up and operate than many so called, "Commercial Ships."

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American Aircraft Directory

Many enquiries have been received by Aviators for information regarding state laws, municipal ordinances, commercial pilots, airports and aircraft operators throughout the United States. To meet this demand, the American Aircraft Directory will be published in 1927 in book form. As many of our readers wish this information immediately, there will be published each week, the data which has been received to date.

It is expected that many additions will be made and our readers are requested to send any corrections, additions or suggestions that they may have. Copyright Gardner Publishing Company.

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Joe Quick
SHEFFIELD
Roscoe Turner

STATE DIRECTORY

ANNISTON

FLYING FIELD
Henry J. Rielly Field, Camp McClellan. Government controlled.
History: This is a part of the military reservation used for aviation.
Location: 2 mi. NE of main portion of Camp McClellan, and 7 mi. NE of Anniston.
Description: 1,600 ft. E and W by 550 ft. N and S.
Facilities: Hangars for planes not larger than De Haviland type; supplies available from Anniston.

BIRMINGHAM

City ordinance regulates flying at not less than 1,500 ft. elevation over center of city, and no stunt flying over any part of city without special permission from the Commissioner of Public Safety. License fee of $100 per year, or $25 per week, is required for operation of an airplane for advertising purposes by means of banners, hand bills, smoke letters, etc.
FLYING FIELD
Roberts Field, controlled by National Guard. Address 31st. Div. Air Service, Alabama National Guard, P. O. Box 570.
History: This field is leased from the Republic Steel and Iron Co. by the state for National Guard purposes.
Location: 3½ mi. from center of city, and 1½ mi. N of fair grounds and race track.
Description: 2,500 ft. N and S by 1,500 ft. E and W; Alt. 640; marked.
AERO ORGANIZATIONS:
Birmingham Flying Club
AIRCRAFT and ACCESSORY COMPANIES
The Glenn E. Messer Co.
Airplane Supplies, instruction, exhibition, etc. Address, 1,338 S. 15th St.

DEMOPOLIS

FLYING FIELD
Whitfield Landing Field. Commercial, owned by J. B. Whitfield.
Location: ½ mi. N of city.
Description: 3,000 ft. E and W by 1,100 N and S; marked.
Facilities: Supplies obtainable on request.

MOBILE

Municipal Flying Field.
History: Established through efforts of American Legion and Chamber of Commerce.
Location: 2 mi. from center of city, ½ mi. from fair grounds, and directly W of Sand Island.
Description: 1,800 ft. sq.; marked.
Facilities: Supplies available from city.

MONTGOMERY

Maxwell Field, government controlled. Air Intermediate Repair Depot.
History: Field set apart for U. S. Air Service and National Guard Reserves.
Location: 4 mi. from town, and S of Tallapoosa River.
Description: 3,000 ft. E and W by 1,500 ft. N and S; Alt., 300 ft.
Facilities: Hangars. Repairs and supplies available.

ARIZONA

Pilots and Operators

COCHISE
H. L. Richardson
PHOENIX
T. L. Weatherford
Barr's Flying Circus, 107 N. Central Ave.
TUSCON
Charles Maysee, c/o Chamber of Commerce.

STATE DIRECTORY

COCHISE

FLYING FIELD
Municipal Field, R. L. Richardson, owner.
Location: ½ mi. SW of postoffice, adjacent to Southern Pacific R.R.
Description: 1,320 ft. sq.; Alt. 4250 ft.; marked.
Facilities: Gas and oil on field; other supplies available in city.

FLAGSTAFF

FLYING FIELD
Municipal Field. Address Chamber of Commerce.
Location: ½ mi. N of center of city, and E of city park and grand stand.
Description: Approximately 1,300 ft. sq.
Facilities: Fuel, oil and repairs in city.

KINGMAN

FLYING FIELDS
Mohave Country Club Field.
History: This field is set apart by the Mohave Country Club for public flying.
Location: 2½ mi. NE of city.
Description: 2,000 ft. sq.; Alt. 3,800 ft.; marked.
Facilities: Gas and oil available in city.
Municipal Field, address Rotary Club.
Location: 2¼ mi. NE from center of city.
Description: 1,250 by 2,000 ft.; Alt. 3,590 ft.; marked.
Facilities: Gas, oil and minor repairs in city.

NOGALES

FLYING FIELD
U.S. Air Service Field, government controlled.
Location: 2 mi. from northern edge of city, and 1½ m. NW of headquarters of Camp Stephen D. Little.
Description: 1,500 by 3,500 ft.; Alt. 3,760 ft.; marked.
Facilities: Supplies available in city.

PHOENIX

FLYING FIELD
Municipal Air Port, operated by city.
History: The city of Phoenix took over the commercial flying field and dedicated it as a municipal air port on Nov. 9, 1925.
Location: 6½ mi. from postoffice in a westerly direction.
Description: 1,320 N and S by 2,640 ft. E and W; Alt. 1,055 ft.; marked.
Facilities: Supplies available in city.

TUSCON

FLYING FIELD
Macauley Municipal Field, owned by Chamber of Commerce.
Location: 4 mi. S of town.
Description: 1,690 ft. E and W by 1,500 ft. N and S.; Alt. 2,400 ft.; marked.
Facilities: Supplies available in city.

WILLIAMS

FLYING FIELD
Webber Field, operated by the City of Williams.
Location: 3,768 ft. from postoffice.
Description: 1,320 by 1,800 ft.; Alt. 6,670 ft.; marked.
Facilities: Gas, oil and minor repairs available in city.

WINSLOW

City ordinance forbids stunt flying over city.
FLYING FIELD
Barrigan Municipal Field, operated by city of Winslow.
Location: ½ mi. from postoffice on NE side of city.
Description: 1,000 by 800 ft.; Alt. 4,850 ft.; marked.
Facilities: Supplies available in city.

YUMA

FLYING FIELD
Fly Municipal Field, owned by Chamber of Commerce.
Location: 4½ mi. from postoffice.
Description: 700 by 2,600 ft.; Alt. 200 ft.; marked.

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Examinations for Second Lieutenants, Air Corps

Boards of officers for the purpose of examining candidates for appointment as Second Lieutenants in the Air Corps, Regular Army, will meet at the following places, January 17th to 22nd, 1927, inclusive:

Bolling Field, District of Columbia; Maxwell Field, Montgomery, Ala.; Marshall Field, Fort Riley, Kansas; Crissey Field, Presidio of San Francisco; Vancouver Barracks, Vancouver, Washington; Mitchel Field, Long Island, N. Y.; Wright Field, Dayton, Ohio; Chanute Field, Rantoul, Ill.; Kelly Field, San Antonio, Texas.

Application for authority to take these examinations should be made to The Adjutant General of the Army, Washington, D. C.

Naval Air Station Pigeons in Record Flight

Making the fastest time yet attained in the 100 mile pigeon flights from Fullerton to San Diego, Naval Air Station birds, at San Diego, captured first and second places in the race staged recently by San Diego pigeon enthusiasts.

There were eighty-two birds entered by ten owners and they were released at Fullerton by S. T. Reed at 8 o'clock on the morning of Nov. 14. The first bird checked in at the Naval Air Station at 9:15 a. m., 9 minutes ahead of the civilian lofts. In winning first and second places, the Navy birds made speeds of 1159.44 and 1154.19 yards per min., demonstrating the training and care given by the Navy in this important work.

Naval Air Appropriations Questioned

After its third secret session on Dec. 15, the House Naval Committee, by a unanimous vote, instructed Representative Thomas S. Butler, chairman of the committee, to confer with President Coolidge on the present state of the Navy. Representative Butler went to the White House to give the President the committee's views on economy in expenditures for naval vessels and aviation.

In addition to telling the President of the committee's dissatisfaction with the present state of the Navy, it was believed Butler asked the Executive his approval of additional funds for the five-year building program of the naval air service. Funds for the first year of the aviation program have been reduced to such an extent in the budget that members of the House Naval Committee estimate it would take ten years instead of five to complete the program.

As a result of this, it is understood that the Naval Appropriations Bill will not be presented until Jan. 3 or 4, which will permit time for the reconsideration of air expenditures.

Army Air Orders

Sec. Lieut. Ralph E. Holmes, Air Corps, Brooks Field, to Scott Field.

Sec. Lieut. Conrad L. Boyle, Field Art., detailed in the Air Corps. He is relieved from assignment to the 76th Field Art., and from duty at Fort D. A. Russell, and will proceed to Brooks Field, reporting to the commandant Air Corps Prim. Fly. Sch.

First Lieut. Edward A. Hillery, Air Corps, Langley Field, to Walter Reed General Hospital, Washington.

First Lieut. Virgil Hine, Air Corps, Brooks Field, to Bowman Field.

Capt. Carl C. Terry, Air Corps (Ord. Dept.), relieved from detail in Air Corps, Fort Sam Houston.

First Lieut. James A. Healy, Air Corps, Kelly Field, to Scott Field.

First Lieut. Edmund W. Searby, Air Corps (Field Art.) relieved from duty in Air Corps, Fort Sam Houston, and is assigned to the 1st Field Art., Fort Sill.

Sec. Lieut. Eyrle G. Johnson, Cav., detailed in Air Corps. Li ut. Johnson is relieved from assignment to the 1st Mach. Gun Squad., Fort Clark, and will proceed to Brooks Field.

First Lieut. Irvin A. Robinson, Air Corps (Inf.) relieved from duty in the Air Corps, Fort Sam Houston, and is assigned to the Infantry at that station.

First Lieut. Irvin Alexander, Air Corps (Inf.) is relieved from detail in the Air Corps. Lieut. Alexander, now at Fort

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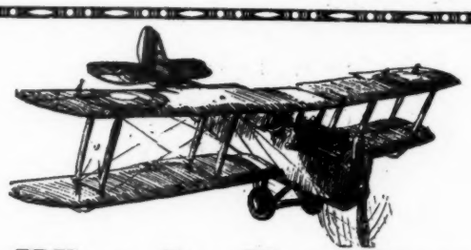

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Sam Houston, is assigned to the Infantry at that station.

Major John C. McDonnell, Air Corps, Wright Field, to Baltimore, Md.

First Lieut. Walter K. Burgess, Air Corps, Colver Field, Santa Monica, appointed survey officer for all materials within that district.

Sec. Lieut. James F. J. Early, Air Corps, Aberdeen Proving Ground, to Brooks Field, after completion of temporary duty at Scott Field.

Sec. Lieut. John Osman Taylor, Air Corps, transferred to Field Art. Lieut. Taylor is relieved from further assignment Fort Sam Houston, and will proceed to Fort Benjamin Harrison.

Capt. James P. Lyons, Inf., detailed to Air Corps. Relieved from assignment at Fort Des Moines, Iowa, and will proceed to Brooks Field.

Capt. Harold Kernan, Field Art., detailed in the Air Corps. Relieved from assignment at Fort Sill, and will proceed to Brooks Field.

Capt. Hubert V. Hopkins, Air Corps, upon completion of tour of foreign service, to Brooks Field.

Capt. William E. Barott, Cav., detailed in the Air Corps. Relieved from assignment at Louisville, and will proceed to Brooks Field.

Navy Air Orders

Capt. Ernest J. King det. com. USS Wright, to temp. duty Nav. Air Sta., Pensacola.

Comdr. Eugene E. Wilson det. Nav. Air Sta., Pensacola, to Bu. Aero.

Lieut. (jg) Herbert S. Duckworth det. VT Sqd. One, Aircraft Sqdns., Sctg. Flt., to Nav. Air Sta., Pensacola.

Lieut. Comdr. Horace R. Boone det. Rec. Bks., Phila., to Nav. Air Sta., Pensacola.

Lieut. (jg) Bates H. Johnston to VS Sqd. One, Aircraft Sqd., Sctg. Flt. Orders Nov. 13 revoked.

Ensign Walter D. Leach det. Nav. Air Sta., Pensacola, to USS Lamson.

Lieut. (jg) Edward M. Harris det. USS Florida, to Nav. Air Sta., Anacostia.

Lieut. Comdr. Robert D. Kirkpatrick det. Bu. Aero., to Asst. Nav. Attache, London, Eng.

Lieut. (jg) Charles C. Yanquell det. Nav. Air Sta., Anacostia, to temp. duty Nav. Med. Sch., Washington.

Lieut. Arthur S. Billings det. VO Sqd. One, U.S.S. Pennsylvania, Aircraft Sqds., Battle Flt., to U.S.S. Langley.

Lieut. (jg) Leo P. Pawlikowski to VJ Sqd. One, Aircraft Sqds., Battle Flt. Desp. Or. June 15 modified.

Ch. Mach. Frederick C. Wolf det. U.S.S. Omaha to Nav. Air Sta., San Diego.

Lieut. George R. Henderson to continue duty Nav. Air Sta., Anacostia. Orders Nov. 12 revoked.

Lieut. (jg) Herbert S. Duckworth det. VJ Sqd. 2, Aircraft Sqd., Sctg. Flt., to VT Sqd. One, Sctg. Flt.

Marine Corps Fliers in Football Formation

Marine Corps fliers believe in carrying athletic formations to the clouds at Quantico, Va. At a given signal, eleven planes took the air for a football formation, piloted by Lieut. W. L. McKittrick (LE); Corp. Price (LT); Capts. W. T. Evans (LG); T. T. Moore (C); J. E. Davis (RG); Lieut. G. H. Towner (RT); Master Sgt. Fry (RE); Lieut. L. H. M. Sanderson (QB); Master Sgts. Blackwell (LH); Pashal (RH); and Capt. L. E. Woods (FM).

Proposal for Special Type Observation Airplane

Office of the Contracting Officer, McCook Field, Dayton, Ohio. Sealed proposals will be received here until 10:30 A. M. April 4, 1927 for the development of a special type observation airplane and furnishing proposed airplanes in quantities of one, two or three at Government's option for test, with option to place additional order for ten airplanes if test of smaller number so warrant. Further information on application.

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‡‡

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PUBLISHER'S NEWS LETTER

The year 1926 has been an experimental period in the United States for commercial aviation. Aroused by the growth of civil aviation or subsidized air transport in other parts of the world, capital in the United States has made its first effort in the direction of securing first hand knowledge of this new transportation facility. There has, fortunately, been no repetition of the stock selling to the public that was in evidence several years ago. The recent companies have all been financed by men well able to conduct the operations in a large way and without thought of immediate return to small investors. But the year's figures are now becoming available and from these some idea of the possibilities may be had.

* * * *

The Philadelphia Rapid Transit Air Service which operated a route from Philadelphia to Washington and later extended it to Norfolk suspended operations for the winter on November 30. The total operating cost which does not take into consideration capital investment was $169,000. As 93,770 miles were flown, the operating cost for a Fokker 3 engine was found to be $1.80 per mile. The total revenue was $46,200 from passengers and $4,400 from mail and express or $.53 a mile. The conclusion of the P.R.T. is that "Transportation of passengers and merchandise can be made to provide about 50 per cent of the total operating cost". The obvious conclusion is that the air mail must provide for the other half. Roughly, if 60 lb. of mail had been carried on every trip at the rate of $3.00 a lb. the total operating costs would have been met.

The P.R.T. has made some very interesting comments on their experiences. It says:

"P.R.T. retired permanently from the air transport field with the close of the Sesqui on November 30. Mitten Management, however, has submitted to Secretary Hoover the results of operation during this period, and has offered to co-operate in the plans of the Department of Commerce for air transport development, submitting also its survey of air transport from New York to New Orleans and Chicago to Atlanta.

"Mitten Management will not begin operation before next spring, as winter service cannot be maintained with sufficient regularity to justify its operation, until the radio communication, weather report service and night lighting facilities now nearing completion in the Government laboratories have been installed.

"P.R.T. Air Service, in five months operation, carried 3695 passengers, demonstrating that the public will use the airplane for transportation purposes when management is such as to inspire its confidence. Every passenger was safely transported and hundreds of letters of commendation were received. 93,770 miles were flown in regular service, without even a minor mechanical failure. Every engine on every plane functioned perfectly at all times. Out of a total of 688 trips scheduled, 75 were cancelled because of adverse weather conditions. Such interruptions to service can be overcome by the Government's new devices.

"Air Service in America has arrived. Its development, under competent management, will make for the most striking resolution in the history of modern transport. Transportation of passengers and merchandise can be made to provide about 50% of the total operating cost. The Federal Government should give air service its share of 2c mail, as authorized by Congress, to insure the added amount of income required."

This leads up to the very interesting event that is to take place in January.

About the middle of next month the Post Office Department will open the bids for the transcontinental air mail route. These bidders will have to determine a policy before they set a price per pound on which they think they can operate. The P.R.T. Air Service believes that "the only practical method of assuring the Government continuous and dependable operation is to provide that only such bids be considered as provide for the carrying of passengers and merchandise, and that for safety's sake multi-motored ships be used." This assertion is so out of line with European practice that it should be considered most seriously before accepting such a sweeping claim.

The Latecoere line to Morocco and Dakar and the C.I.D.N.A. line from Paris to Warsaw and Constantinople use single engine aircraft that can take from one to three passengers in with the mail and packages. They have a few two engined planes but fly them only where the traffic warrants their use. The K.L.M. that operates air liners from Holland has standardized on single engined planes. The Imperial Airways only adopted twin-engined and three engined planes when the subsidy was altered so as to give larger returns than from the single engined aircraft. The Duruluft, the Russian line uses only single engined planes. The Deutsche Luft Hansa, the largest system of air lines in Europe only uses multi-engined planes on their main lines where the traffic is large. On all the others, single engined planes are used. The conclusion from these facts must be convincing. Aircraft must be made to pay and to accomplish this, the type of the plane must be determined by the demands of the traffic and not a hard and fast rule.

* * * *

Another important decision to be made is whether or not the United States is to have an aircraft system which has a chance of success or is to repeat the experience of the railroads and permit a haphazard development that will lead to great difficulties. For the last ten years efforts have been made to bring competing and adjoining railways into systems. Obstacles are being encountered at every step. Are we to repeat the experience with our air lines? To let the air routes of the country be operated by contractors on unnatural and obviously unprofitable routes is not only unwise but will do more to prevent the coming of commercial aviation than any other procedure. Now is the time to learn from the experience of the railroads in this country and the disastrous results of too small and short air lines abroad.

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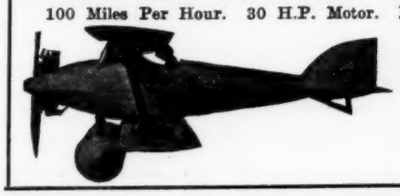

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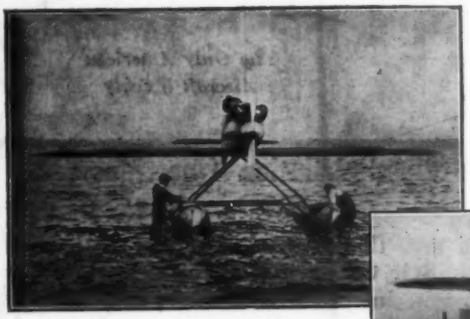

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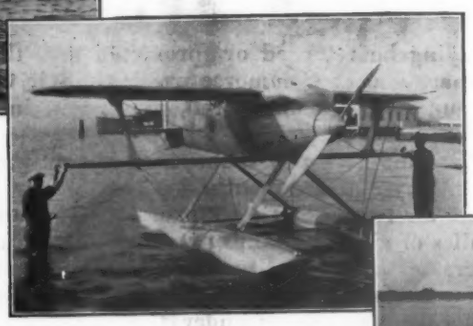

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